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Oncoplastic Breast Conserving Surgery: Is There a Need for Standardization? Results of a Nationwide Survey

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Keywords

Breast cancer · Breast-conserving surgery · Oncoplastic breast-conserving surgery · The NABON Breast Cancer Audit · Quality of care

Abstract

Introduction: The NABON Breast Cancer Audit showed that more than 70% of the Dutch women undergoing surgery for breast cancer maintained their breast contour by breast-conserving surgery (BCS) or by immediate reconstruction after ablative surgery. The proportion of oncoplastic surgery applied in patients undergoing breast-conserving treatment remains unknown. The aim of our study was to assess the need for standardization of oncoplastic breast-conserving surgery (OPBCS) in an attempt to enable measurement of the quality of OPBCS. ***Methods:*** To gain a better understanding of current practice in OPBCS, we sent a questionnaire to all breast surgeons in The Netherlands who are members of the breast surgery working group (n = 134). ***Results:*** A total of 60 breast surgeons, representing different hospitals in The Netherlands, responded. 61.7% of the breast surgeons performed BCS on 60–100% of their patients. 68.3% responded that BCS was performed using OPS techniques in up to 40% of their patients. OPBCS was defined as level I volume displacement by 45.2% of the breast surgeons and as BCS performed by a breast surgeon and plastic surgeon together by 32.3% of the breast surgeons. 94.5% indicated that there is a need for standardization of the definition of OPBCS in The Netherlands. ***Conclusion:*** This study demonstrates that OPBCS is a major part of daily clinical practice of Dutch breast surgeons treating BC patients. Despite this, there is no clear definition of OPS in breast-conserving treatment in The Netherlands. Only after standardization can a classification code and quality indicator be initiated for OPBCS. Ultimately, this will facilitate improvement in quality of BC care.

Introduction

In The Netherlands, around 14,000 women with invasive breast cancer and 2,000 with ductal carcinoma in situ are annually diagnosed and surgically treated [1, 2]. In the past 20 years, improvement in diagnostic workup by digital screening mammograms, multidisciplinary team meetings, and tailored systemic therapy has led to an increase in the 10-year survival rates [3] and a significant decrease in local recurrence rates for women with breast cancer [4]. These developments have led patients who

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Table 1. Defining oncoplastic breast-conserving surgery (OPBCS) division among three levels

Level	Criteria
I	Volume displacement (up to 20% of the breast volume) is achieved by re-approximation and suturing of the gland
II	Volume displacement (20–50% of the breast volume) by mammoplasty techniques like nipple displacement/re-centring and small (<10%) local transposition flap
III	Volume displacement transposition flaps

survived breast cancer to live longer with the post-treatment aesthetic results [5].

A multidisciplinary team of medical specialists carries out the care of breast cancer patients. Quality of care can be improved by monitoring and giving benchmarked feedback to clinicians [6]. For this reason, the nationwide multidisciplinary quality registration NABON ("National Breast Cancer Organisation Netherlands") Breast Cancer Audit (NBCA) was established in 2011 to monitor the care trajectories of breast cancer patients by quality indicators [7]. In the early years of the NBCA, an attempt was made to measure aesthetic outcomes by monitoring the rate of breast-conserving surgery (BCS) and immediate breast reconstruction (IBR) after mastectomy [7–10]. However, population-based studies have shown stable BCS and IBR rates over the past years, of 60% and 28%, respectively [7, 10, 11]. To gain more insight into the various ways of maintaining breast contour, in 2016, the composite indicator "breast contour-preserving procedure" was introduced as a quality measure that combines the parameters primary BCS, BCS after neoadjuvant chemotherapy, and mastectomy with IBR [9]. This indicator showed that more than 70% of the women with breast cancer maintained their breast contour following initial mastectomy or BCS [9, 12].

Despite these developments in the NBCA, the proportion of oncoplastic surgery (OPS) applied in patients undergoing breast-conserving treatment remains unknown. OPS was first described in the early nineties with the aim to improve the aesthetic outcome of the breast and quality of life of the patient [13–20]. In the following years, a wide range of surgical techniques were developed to operate cancer more effectively while simultaneously maintaining the cosmetic appearance of the breast [21]. Although several detailed classifications have been suggested, an international standardization of OPS in patients undergoing breast-conserving treatment is still lacking [20, 22–30]. The global Oncoplastic Breast Consortium [31], a multidisciplinary group of surgeons and patient advocates, showed that various countries had similar knowledge gaps on definition of OPS [32]. Various studies from different countries conclude that standardization is necessary to conduct comparative research, meaningful guidelines, and accreditation of training programmes [30, 32, 33].

In an attempt at standardization, in 2018, the Dutch breast reconstruction guideline was published by the Netherlands Society of Plastic Surgery (NVPC) [34]. A division was made between three levels in oncoplastic breast-conserving surgery (OPBCS) (shown in Table 1) [23].

At the same time, the breast cancer working group of the Dutch Society of Surgical Oncology (NVCO) confirmed that OPBCS, and the adoption of these techniques, is needed to provide complete breast cancer care to their patients. Although the guideline provides the opportunity to perform OPBCS as a certified surgical oncologist, the standardization of OPBCS nomenclature, indication, and outcome is still missing.

To gain a better understanding of current practice in OPS in patients undergoing breast-conserving treatment (OPBCS), we sent a questionnaire to all surgical oncologists in The Netherlands who are members of the NVCO breast cancer working group. The aim of this study was to assess the need for standardization of OPBCS in an attempt to enable measurement of the quality of OPBCS by developing a new quality indicator.

Material and Methods

Participants

Certified surgical oncologists in The Netherlands who are members of the NVCO breast cancer working group (referred to as breast surgeons in this study) (n = 134) were invited by e-mail to participate in a self-administered survey. The responses were collected over a 7-month period from July 2020 to January 2021. To maximize response rates, two reminders were sent after 2 months and 4.5 months.

Survey

Selected members of the NBCA scientific committee, including a breast surgeon, a radiation oncologist, and a medical researcher, developed the survey. Members of the board of the breast cancer working group of the NVCO reviewed the survey. The first part of the survey consisted of three personal demographic questions for the participating surgeons (annual procedural volume in breast surgery and proportion of BCS and OPBCS) and four questions about performing OPBCS (performed OPS techniques by the breast surgeon and indication for collaboration with a plastic surgeon when performing BCS). The second part contained six questions about the need for standardization (indication, goals, and safety) and one question about awareness of current guidelines. The last part contained two questions about the classification codes used for diagnosis and treatment for this specific patient group [35]. All questions included in the survey are shown in online supplement 1 (for all online suppl. material, see www.karger.com/doi/10.1159/000528635). Some questions in the survey allowed multiple answers, resulting in a total response percent-

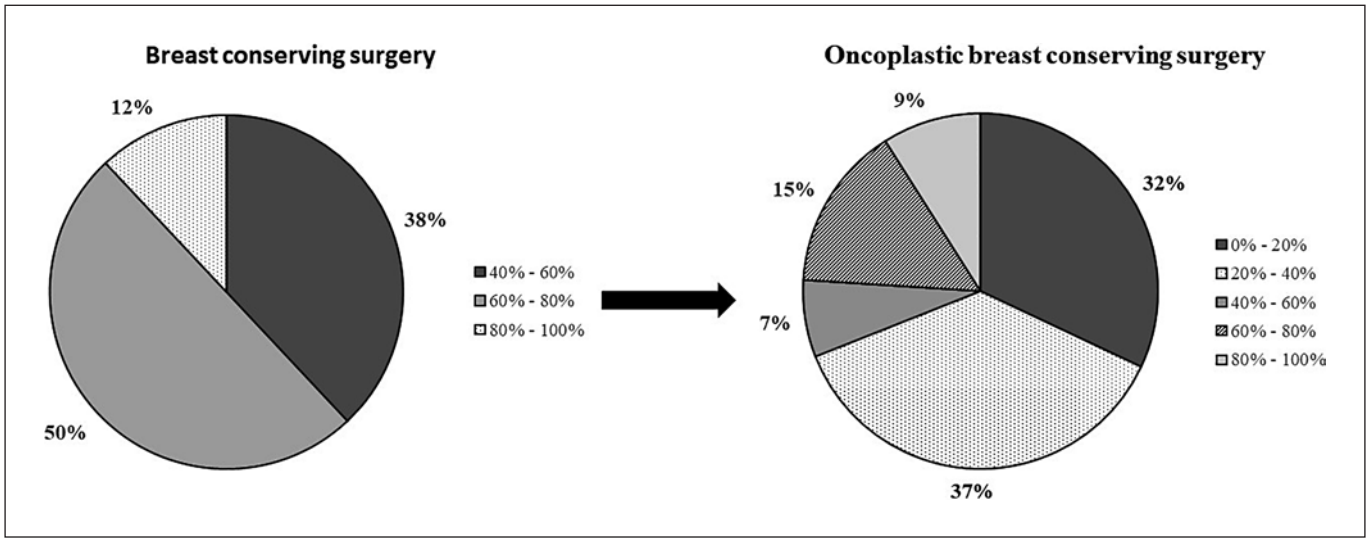

Fig. 1. Percentage of breast-conserving surgery (BCS) and oncoplastic breast-conserving surgery (OPBCS) per breast surgeon.

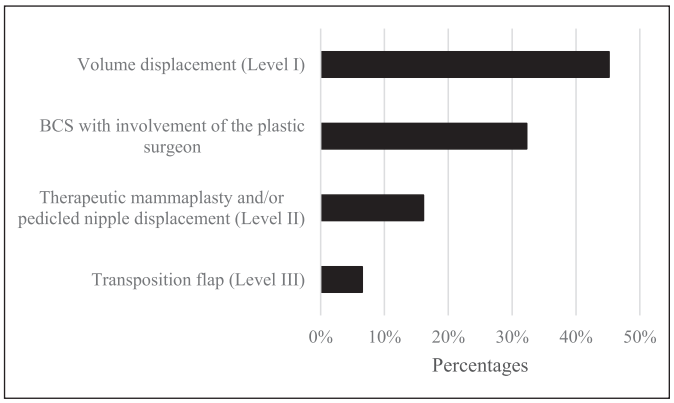

Fig. 2. Definitions that are used for oncoplastic breast-conserving surgery (OPBCS) by breast surgeons in percentages.

age for these questions of more than 100%. The survey was conducted anonymously, using Google Forms (https://www.google.nl/intl/nl/forms/about/): an online data collection programme.

Statistical Analysis

The results were analysed using R, version 3.6.1 (for Windows, RStudio, Inc.) to produce descriptive statistics. Responses to individual questions were stated as frequencies and percentages.

Results

Surgeon Characteristics

A total of 60 breast surgeons, treating breast cancer patients, representing different hospitals in The Netherlands responded; 40% (n = 24) performed 50 till 100, 31.7% (n = 19) 100 till 150, 10% (n = 6) 150 till 200, 10% (n = 6) 200 till 250, and 8.3% (n = 5) more than 250 oncological breast operations per year. All of the respondents indicated to perform BCS in at least 40% of their patients, with 61.7% of them (n = 37) reporting to perform BCS in 60–100% of their patients. Most breast surgeons, 68.3% (n = 41), responded that BCS using OPS techniques was performed in up to 40% of their patients (shown in Fig. 1).

Definition and Performance of OPBCS

Breast surgeons defined OPBCS differently; 45.2% defined level I volume displacement as OPBCS, whereas 32.3% of the breast surgeons defined OPBCS as BCS performed by a breast surgeon and plastic surgeon together (shown in Fig. 2). All breast surgeons perform level I OPBCS, of whom 10% carry out the procedure together with a plastic surgeon. Level II OPBCS was performed by 21.7% of the breast surgeons, of which 13.3% performed with involvement of the plastic surgeon. Level three was done by 6.7% of breast surgeons and exclusively in collaboration with the plastic surgeons (shown in Fig. 3). It is noticeable that only 76.7% of the breast surgeons were acquainted with the Dutch guideline on "breast reconstruction."

The survey showed that in The Netherlands, most breast departments make no distinction between breast surgeons who do or do not perform OPBCS (81.4%). Most breast surgeons consider it important to be able to perform OPBCS (68.3%).

The breast surgeons indicated that OPBCS can be used to maintain the breast contour (70%), improve aesthetic outcomes (57%), improve quality of life (46%), reduce re-operation rates for positive margins (28%), and reduce

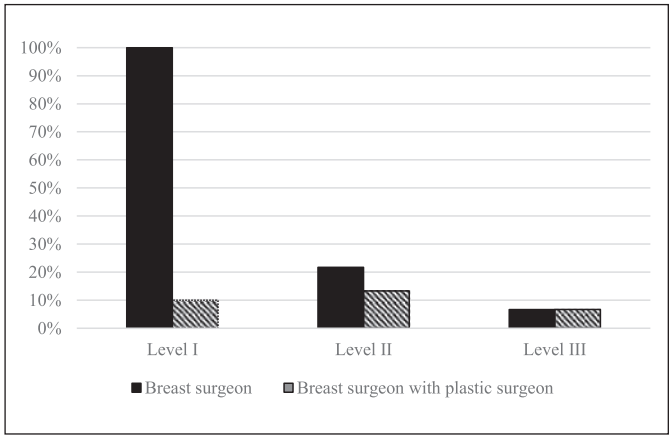

Fig. 3. Level of oncoplastic breast-conserving surgery (OPBCS) done by a breast surgeon and the level of OPBCS done by a breast surgeon in collaboration with a plastic surgeon involved.

local recurrence rates (7%). 96.7% of the breast surgeons consider OPBCS compared to standard BCS as safe, and most surgeons do not consider comorbidities as a contraindication (59.7%). When specifically asked about contraindications, smoking (18.2%), diabetes mellitus (9.1%), and high body mass index (6.5%) were listed. Radiotherapy was also mentioned as a contraindication by 6.5% of the breast surgeons due to potential challenges in defining the (boost) target volume in patients receiving OPBCS.

Almost all breast surgeons (94.5%) indicated that there is a need for standardization of the definition of OPBCS. We asked for the main motives for standardization (options were outcome measurement, clinical research, uniformity in nomenclature, choice of reconstruction, to set an indication, health insurance, collaboration with the plastic surgeon, and/or contraindication). Outcome measurement (32.7%) and nomenclature (29.1%) were seen as the main motives for standardization.

Classification Code for OPBCS

Analyses showed that there is no standard classification code for OPBCS, making it not possible to invoice the procedure to health insurers. Breast surgeons invoice OPBCS by using the "standard" classification code: "local excision breast tumour" (74.6%) and additional classification code: "correction of the deformity of the breast" (9.5%). 15.9% of the breast surgeons did not know which classification code they used for the procedure. The breast surgeons indicated that when a plastic surgeon is involved, the following classification codes are used: local excision breast tumour (38.8%), correction of the deformity of the breast (10.4%), and specific plastic surgery performance code (16.4%) (e.g., tissue expander, volume displacement transposition flaps). 34.3% of the breast surgeons did not know which code they or the plastic surgeon were using. Based on the answers of the survey, it became clear that both the breast surgeon and the plastic surgeon invoice the procedure when the plastic surgeon is involved during the operation.

Discussion

This survey depicts the opinion of 60 breast surgeons in The Netherlands on OPS in breast cancer patients undergoing breast-conserving treatment (OPBCS). Literature shows that in the past decade, there is an increasing international interest in OPS procedures and that consensus for standardization is actively sought [33]. In this study, the need for standardization of OPBCS was assessed in an effort to measure the quality of OPBCS by developing a new quality indicator.

Of the survey respondents, we can conclude that OPBCS, although not defined identically by the different surgeons, is a major part of daily clinical practice when treating breast cancer patients. Van Bommel et al. [9] described stable BCS rates of approximately 60% from 2011 till 2014, while increasingly more patients retain their breast contour by BCS after neoadjuvant chemotherapy and mastectomy followed by IBR. However, as it is unknown how many patients received OPS within BCS, it is not possible to distinguish the oncoplastic part within this group.

While most of the breast surgeons described OPBCS as volume displacement "level I," a third only use the definition OPBCS when the involvement of a plastic surgeon is needed. According to the Dutch breast reconstruction guideline, the involvement of a plastic surgeon during OPBCS procedures is recommended when volume displacement techniques are needed, nipple displacement/re-centring has to be done, and when there are doubts about the feasibility of the cosmetic result [34]. This expert-based guideline, however, mainly represents the view of the plastic surgeon in an era lacking formal oncoplastic training of the breast surgeon.

Almost all breast surgeons consider OPBCS compared to BCS as safe; this result is similar to previous published studies. However, earlier published literature is scarce; the safety and quality of OPS techniques have never been researched in prospective multicentre studies. Giacalone et al. [36] described in 2006 more accurate tumour resection in patients who underwent OPBCS compared to standard quadrantectomy. Veiga et al. [37] described in 2010 that 2 patients (of the 42 patients who received OPBCS) had local recurrence of breast cancer in month 4 and 9 after surgery and underwent mastectomy. A prospective study comparing conventional BCS with OPBCS has not been done; for this reason, a current definition of good quality of OPBCS is lacking.

In line with the results from the OPBC consensus conference on standardization of OPBCS survey [30], 83.3% of the Dutch breast surgeons indicated that there is a need for standardization of OPBCS. The main reasons being the outcome measurement (e.g., cosmetic result and local recurrence rates) and uniformity in nomenclature. Although comorbidities were not seen as contraindication by the majority of breast surgeons, consistent with previous literature, smoking, diabetes mellitus, and high body mass index were mentioned as contraindication when specifically asked [38].

Specific challenges for radiation treatment as part of breast-conserving therapy after OPBCS are defining the target volume, especially when it comes to defining the boost area or when patients are treated with partial breast radiation. To address these potential future challenges of defining target volume in OPBCS, the Canadian Consortium for Locally Advanced Breast Cancer has developed recommendations. These recommendations focus on marking the tumour bed by surgical clips, whereby breast surgeons and radiotherapists must speak the same language. The breast surgeon should clearly describe the OPBCS procedure in the surgery report, and the radiation oncologist should be familiar with the different surgical techniques. According to a retrospective study by Borm et al. [39] rearrangement of tissue during OPS does not influence the effectiveness of adjuvant whole breast radiotherapy and boost irradiation on local control rates in breast cancer patients who received immediate OPS. Randomized studies have not yet been performed; however, the Dutch guideline recommends a multidisciplinary approach when considering OPBCS, in which the plastic surgeon and radiation oncologist actively participate [40].

The results of the present study suggest that a certain group of breast surgeons have specialized themselves in OPBCS techniques, in an evolution to dedicated breast surgeons. However, this survey shows that most breast departments make no distinction between breast surgeons who do or do not perform OPBCS.

In the European Society of Breast Cancer Specialists (EUSOMA) criteria, it is mandatory that a breast surgeon should be able to perform level I and II oncoplastic techniques [41]. Even level III (e.g., chest wall perforator flaps) can be considered part of a dedicated breast surgeon's oncoplastic armamentarium [42]. Furthermore, the EUSOMA criteria emphasize the need to educate and train new breast surgeons in OPBCS by experienced oncoplastic breast surgeons.

As in The Netherlands OPBCS is not reimbursed separately within the healthcare compensation system, Dutch breast surgeons use a variety of performance codes to invoice the extra work when performing OPBCS alone. When OPBCS is performed by surgeon and plastic surgeon together, they both register a different performance code.

The results of this Dutch study demonstrate the need for standardization and awareness for OPBCS and can be parallelled to other western countries where OPS is performed. Generating OPBCS makes it possible to make oncoplastic procedures the expertise of breast surgeons. Although it is questionable whether these 60 breast surgeons represent the most important opinion about OPBCS in The Netherlands, the main strength of this survey is that the respondent of this study treated an average of 7,825 of the 16,000 patients annually: a national coverage of 48.9%.

The basis for defining good quality of care is to gain insight into current practice. By prospectively registering OPBCS data from breast cancer patients in a national multidisciplinary audit (NBCA), current practice can be shown. With these results, it is possible to improve quality of OPBCS in The Netherlands by providing benchmark information. In The Netherlands, benchmarking has led to improvements in quality of breast cancer care by a multidisciplinary set of quality indicators within the NBCA [6, 7]. The NBCA also aims to include patient-reported outcome measures, so in the future, OPBCS can be correlated with patient-reported outcome measures to refine the decision-making process and ultimately improve the quality of life for the breast cancer patient.

Conclusion

This study demonstrates the need for a standardization of the definition of OPS applied in BCS in The Netherlands. There is currently no consensus on OPS in BCS. A guideline revision in collaboration with the different medical disciplines involved in breast cancer care (breast surgeons, plastic surgeons, and the radiation oncologist) seems necessary. Embracing all levels of oncoplastic techniques is a prerequisite for breast surgeons to evolve into dedicated breast surgeons. Only after standardization can a classification code and quality indicator be initiated for OPS in BCS. Ultimately, this will facilitate improvement in quality of breast cancer care.

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The Netherlands; and José H. Volders, MD PhD, Department of Surgery, Gelre Hospitals, Apeldoorn and Zutphen, The Netherlands.

Statement of Ethics

The Dutch Institute for Clinical Auditing (DICA) is one of the leading organizations that facilitate clinical auditing in The Netherlands [6, 43]. DICA offers participants in its clinical audits the possibility of submitting an application to receive data from clinical audits for the purpose of scientific research under strict conditions. These applications are assessed at several levels.

In the participation agreement between DICA and the participants in clinical audits, to which the DICA Regulations also apply, further conditions are set for the use of data for scientific research. These conditions include that only pseudonymized or anonymized data that cannot (directly) be traced back to individual patients may be made available. The parties also agree that, in accordance with the applicable laws and regulations, the participants will set up a system of no objection that offers the patient the possibility to explicitly object to the use of his/her data for scientific research in advance. In this way, the patient's privacy will be protected as much as possible.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Author Contributions

Nansi Maliko, Thomas Schok, Marie-Jeanne TFD, and Vrancken Peeters: conception and design, analysis and interpretation, writing the manuscript, critical revision, and statistical analysis. Nina Bijker, Michel WJM. Wouters, Luc JA. Strobbe, and Marije J Hoornweg: conception and design, analysis and interpretation, writing the manuscript, and critical revision. All authors have read and approved the final manuscript and agreed to be accountable.

Data Availability Statement

The datasets generated and/or analysed during the current study are available from the corresponding author on reasonable request.

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