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Understanding the factors that influence breast reconstruction decision making in Australian women

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ABSTRACT

Background: Breast reconstruction is safe and improves quality of life. Despite this, many women do not undergo breast reconstruction and the reasons for this are poorly understood. This study aims to identify the factors that influence a woman's decision whether or not to have breast reconstruction and to better understand their attitudes toward reconstruction.
Methodology: An online survey was distributed to breast cancer patients from Breast Cancer Network Australia. Results were tabulated, described qualitatively and analyzed for significance using a multiple logistic regression model.
Results: 501 mastectomy patients completed surveys, of which 62% had undergone breast reconstruction. Factors that positively influenced likelihood of reconstruction included lower age, bilateral mastectomy, access to private hospitals, decreased home/work responsibilities, increased level of home support and early discussion of reconstructive options. Most common reasons for avoiding reconstruction included "I don't feel the need" and "I don't want more surgery". The most commonly sited sources of reconstruction information came from the breast surgeon followed by the plastic surgeon then the breast cancer nurse and the most influential of these was the plastic surgeon.
Conclusions: A model using factors easily obtained on clinical history can be used to understand likelihood of reconstruction. This knowledge may help identify barriers to reconstruction, ultimately improving the clinicians' ability to appropriately educate mastectomy patients and ensure effective decision making around breast reconstruction.

Background

In Australia, 15,000 women are diagnosed with breast cancer each year [1]. Five year survival is now greater than 89% and breast reconstruction has not only been widely accepted as oncologically safe, but also shown to be beneficial to quality of life in women following mastectomy [2–4]. Clinical guidelines around the world recommend, and in many cases mandate, that breast reconstruction options be reviewed with every breast cancer patient. Despite these recommendations, even specialized cancer centres only reach reconstruction rates of 50–80%, while many national rates are as low as 5% [5].

Several studies have identified demographic, tumour-related, hospital/geographic and psychological factors that influence the likelihood of reconstruction [5]. Despite this recent knowledge, the rates of reconstruction have been increasing at only a modest pace over the last 10 years [6–8]. With increasing availability and confidence of surgeons skilled in the spectrum of breast

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reconstructive options and the advances in implant materials, fewer contraindications exist and it is perhaps surprising that these rates are not increasing more rapidly.

In a recent Australian study [4] it was shown that by offering all mastectomy patients reconstructive options during a multidisciplinary visit, the take up of breast reconstruction increased from the national average of 12% to an impressive 41%. This still leaves 59% of women choosing not to have reconstruction; many for reasons we have not yet identified.

Since the majority of women seeking breast reconstruction will likely be long-term survivors, the choices they make will have long lasting effects on their quality of life. It is, therefore, important that surgeons and patients alike are given the tools for relevant education to allow for informed and effective decision-making to occur. Recent studies have shown our success in this regard to be less than ideal [9]. In Australia, the National Safety and Quality Health Services Standards emphasize "Partnering with the consumer" to improve safety, quality and efficiency [10]. To date, however, published attempts to understand the patient's experience around breast reconstruction in Australia have been minimal [4,11–13]. This understanding can only be successfully achieved through patient-centered investigation into the factors that influence their decisions. As such, the purpose of this study was to report on the breast cancer reconstruction experience of a broad group of Australian women and describe the factors that influenced their decision whether or not to have breast reconstruction.

Subjects and methods

The study population was derived from members of Breast Cancer Network Australia's (BCNA) Review and Survey Group, consisting of breast cancer survivors who agreed to be contacted for breast cancer research. Survey design and data collection was conducted by Cogentum Inc. (Melbourne, Australia) following qualitative research with breast cancer survivors, the BCNA and plastic and reconstructive surgeons. The purpose of this initial research was to inform the Neopec project, a multidisciplinary Victorian State government supported commercialisation project on breast reconstruction directed through the O'Brien Institute at St. Vincent's hospital in Melbourne. This data was de-identified and ethics review board approval was obtained for its analysis in this study.

The online survey was sent to all 1300 members of the database, of which 736 women responded (57%). We restricted our analysis to the 501 patients who had a complete mastectomy; either unilateral or bilateral (68% of respondents). The remainder, having undergone breast conserving surgery (BCS), were excluded. The survey was designed to gather details of the surgery performed as well as socio-demographic information. In addition, information regarding the patients' experience with breast cancer, such as timing of awareness of breast reconstruction options, information sources, influential individuals and reasons for choosing or not choosing breast reconstruction were also collected.

Statistical analysis

The following variables were assessed for association with the probability of a patient opting for reconstruction: type of procedure (unilateral or bilateral mastectomy); type of hospital (public or private); location of hospital (urban or regional); age at surgery; family situation (children living at home or no children living at home); work status (employed or not employed); level of home/work responsibilities; level of home support; timing of discussion regarding reconstruction (discussion before surgery or no discussion before surgery) and influential individuals. Levels of home/work responsibilities and home support were measured on a 5-point scale, with high scores corresponding to higher levels of responsibility and support. Patients also used a 10-point scale to rate the degree to which individuals in their circle of care contributed to their decision.

Exploratory checks for collinearity were conducted on all variables and those identified to be important through uncontrolled logistic regression analyses were entered into a multiple logistic regression model. Model discrimination was assessed by calculating the area under the ROC curve, goodness-of-fit was assessed using the Nagelkerke pseudo-R^2 statistic, and the model was calibrated by means of the Hosmer–Lemeshow statistic. Diagnostic statistics for individual cases were also calculated.

To investigate the expected take-up rate of reconstruction among women who were not offered the option of reconstructive surgery, a subsidiary multiple logistic regression model was derived, excluding the factor relating to the timing of an offer of reconstruction, and applied to women who had received an offer of reconstruction. Parameter estimates obtained from this model were used to determine predicted probabilities of the expected outcome of reconstruction in women not offered the option of reconstructive surgery. The resulting proportion was then used to augment the overall estimate of the proportion of patients opting for reconstruction.

Results of exploratory analyses, diagnostic and calibration statistics and missing values analysis are given in an appendix to this document.

All data was analyzed using SPSS statistical software (Version 20.0).

Results

Sample demographics

Of the 501 mastectomy patients included in the analysis, 323 (65%) had a unilateral mastectomy and 178 (35%) had bilateral mastectomies. 309 (61.5%) of these mastectomy patients underwent breast reconstruction; 140 (45%) had implant-based breast reconstruction, 135 (44%) had tissue transfer and 34 (11%) had both implant and tissue transfer. Information as to the timing of the reconstruction was provided by 293 mastectomy patients who underwent breast reconstruction. Of these, 130 patients (44.4%) underwent immediate reconstruction while the remainder had a delayed reconstruction.

Average age for the cohort was 48.9 years (standard deviation 9.1 years). 403 (80.4%) of our study patients were employed at the time of their breast surgery and 351 (70.1%) had access to private hospital cover. Most patients had children living at home (270; 53.9%) and had moderate to high home/work responsibilities (median score: 4 on a 5 point scale) and support at home (median score: 4 on a 5 point scale).

Almost all patients in this sample (91%) recall having had some discussion regarding reconstruction (9% never had the option of reconstruction discussed with them). 61% had their initial discussion prior to their breast surgery.

Reasons for choosing not to have breast reconstruction

Of the women who thought about and decided not to have breast reconstruction ($n = 95$), the most common reasons for their decision included "I don't want any more surgery" (68%) and "I don't feel the need for it" (58%). These women were also significantly worried about the potential of future complications, additional hospital visits and poor outcomes. Notably, 20% of this group also said they "can't afford the cost of the surgery". Additional reasons recorded are described in Fig. 2 below. These reasons