

# Comparison of Patient-reported Outcomes after Implant Versus Autologous Tissue Breast Reconstruction Using the BREAST-Q

Ortensia Pirro, MD\*  
 Ondrej Mestak, MD†  
 Vincenzo Vindigni, MD\*  
 Andrej Sukop, MD‡  
 Veronika Hromadkova, MD†  
 Alena Nguyenova†  
 Lenka Vitova, MD†  
 Franco Bassetto, MD\*

**Background:** The demand for reconstructive breast procedures of various types has accelerated in recent years. Coupled with increased patient expectations, it has fostered the development of oncoplastic and reconstructive techniques in breast surgery. In the setting of postmastectomy reconstruction, patient satisfaction and quality of life are the most significant outcome variables when evaluating surgical success. The aim of this study was to evaluate the quality of life after implant breast reconstruction compared with autologous breast reconstruction.

**Materials and Methods:** A cross-sectional study design was used. A total of 65 women who had completed postmastectomy implant-based or autologous reconstruction in the participating center were asked to complete the BREAST-Q (Reconstruction Module).

**Results:** Data analysis demonstrated that women with autologous breast reconstruction were significantly more satisfied with their breasts ( $P = 0.0003$ ) and with the overall outcome ( $P = 0.0001$ ) compared with women with implant breast reconstruction. All other BREAST-Q parameters that were considered and observed were not significantly different between the 2 patient groups.

**Conclusions:** Through statistical analysis, our results showed that patients who underwent autologous tissue reconstruction had better satisfaction with the reconstructed breast and the outcome, while both techniques appear to equally improve psychosocial well-being, sexual well-being, and chest satisfaction. (*Plast Reconstr Surg Glob Open* 2017;5:e1217; doi: 10.1097/GOX.0000000000001217; Published online 25 January 2017.)

**M**astectomy undoubtedly has a traumatic effect on the lives of women diagnosed with breast cancer.<sup>1-3</sup> This perception may impact their social, personal, and sexual relationships.<sup>4</sup> Half of all women who undergo a mastectomy perceive a negative self-image and experience negative changes in their sexuality.<sup>5</sup> Breast reconstructive surgery can reduce the psychological trauma associated with loss of the breast.<sup>6</sup>

From the \*Plastic Surgery Unit, School of Medicine, University of Padova, Padova, Italy; †Department of Plastic Surgery, Bulovka Hospital, 1st Medical Faculty, Charles University in Prague, Prague, Czech Republic; and ‡Department of Plastic Surgery, University Hospital Kralovske Vinohrady, 3rd Medical Faculty, Charles University in Prague, Prague, Czech Republic.

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The demand for reconstructive procedures of various types has accelerated in recent years, which, coupled with enhanced patient expectations, has fostered the development of oncoplastic and reconstructive techniques in breast surgery. Surgeons throughout the world have described a wide array of reconstructive techniques, including the use of expanders, implants, and tissue flaps. Autologous reconstructions have generally been considered by most plastic surgeons to be superior to implants because they adhere to the reconstructive axiom of replacing like with like.<sup>7</sup> Clinical outcomes research in plastic surgery now not only examines morbidity and mortality but also assesses patient perceptions regarding results and improvement in quality of life.<sup>8,9</sup> The patient experience is important in breast surgery as it affects the patient psychosocially, her physical functioning, and the aesthetic result.<sup>10</sup>

As such, key indicators such as patient satisfaction and health-related quality of life are becoming important outcomes for evaluating the success of cosmetic and reconstructive breast surgery.

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The aim of this cross-sectional study was to compare the quality of life in women who underwent breast reconstruction with implants with those who underwent free transverse rectus abdominis myocutaneous (TRAM) flap breast reconstruction, using BREAST-Q<sup>11</sup> to appraise patient-reported outcomes.

## METHODS

### Sample

The study population consisted of women who had undergone breast reconstruction after mastectomy for breast cancer. The patient sample was recruited at the University Hospital of Bulovka in Prague, Czech Republic. The choice of the reconstructive procedure for each patient is based on an evaluation of quality of tissue in area after mastectomy, body mass index, size of contralateral breast, and an excess of soft tissue in the lower abdomen. Patients with tight skin after radiotherapy and with higher body mass index are more prone to receive free TRAM flap breast reconstruction. The study population consisted of 2 groups of women, the patients who underwent mastectomy and delayed breast reconstruction with implants and patients who underwent mastectomy and delayed breast reconstruction with the free TRAM flap.

The inclusion criteria included mastectomy patients who had undergone and completed breast reconstruction (unilateral or bilateral) between January 2012 and January 2015. The protocol was approved by the Ethical Review Board of Bulovka Hospital in Prague, and all patients signed informed consent before participating in the study.

### Procedure

A cross-sectional study design was used. Recruitment of patients was based on electronic medical records analysis. Afterward description of the study and a BREAST-Q breast reconstruction postoperative questionnaire were sent to both groups of patients (50 letters for each group). The questionnaire booklet was mailed along with a self-addressed, postage-paid return envelope according to the type of reconstruction. The questionnaires were marked with different colors to differentiate between implant breast reconstruction and autologous breast reconstruction. We received responses from 34 patients who underwent implant breast reconstruction and 31 patients who underwent free TRAM flap reconstruction, giving a total of 65 patients.

### BREAST-Q

The BREAST-Q (Memorial Sloan-Kettering Cancer Center and the University of British Columbia, 2006, all rights reserved) is a patient-reported outcome measure that was specifically designed to measure the quality of life and patient satisfaction among breast surgery patients.<sup>11</sup> The instrument was developed and validated with adherence to guidelines set by the Scientific Advisory Committee of the Medical Outcomes Trust (2002) and the US Food and Drug Administration.<sup>12-15</sup> The BREAST-Q reconstruction module was used as the primary outcome measure in this study.

The scales forming the BREAST-Q reconstruction module are as follows: satisfaction with breasts, satisfaction with the overall outcome, psychosocial well-being, sexual well-being, physical well-being of the chest, satisfaction with nipple areola reconstruction, satisfaction with information, satisfaction with the surgeon, satisfaction with the medical team, and satisfaction with the office staff.

The patients' responses to each scale's items were analyzed through the Q Score that analyses data based on RUMM 2020, a data-analyzing program developed by Rasch Unidimensional Measurement Models Laboratory. This software automatically transforms raw data into summary scores that range from 0 (very dissatisfied) to 100 (very satisfied) for each scale. For all BREAST-Q scales, a higher score indicates greater satisfaction or better quality of life. A mean change of 5 to 10 on a multi-item scale is perceived as "a little" change, 10 to 20 as "a moderate" change, and greater than 20 as "a maximal" change.

Before commencing the study, the questionnaire had a Czech translation validated in accordance with the agreement with the MAPI Trust (<http://www.mapi-trust.org/>). The translated version was approved by Andrea Pusic, the author of the BREAST-Q.

### Statistical Analysis

The obtained data were reported in Excel (Microsoft Corp., Redmond, Wash.) and were analyzed using SAS statistical software package version 9.4 (SAS Institute Inc., Cary, N.C.). Data are expressed as the mean and SD. Comparisons between breast reconstruction with implants and breast reconstruction with autologous tissues were made using a paired sample *t* test. Significance was considered at  $P < 0.01$ .

## RESULTS

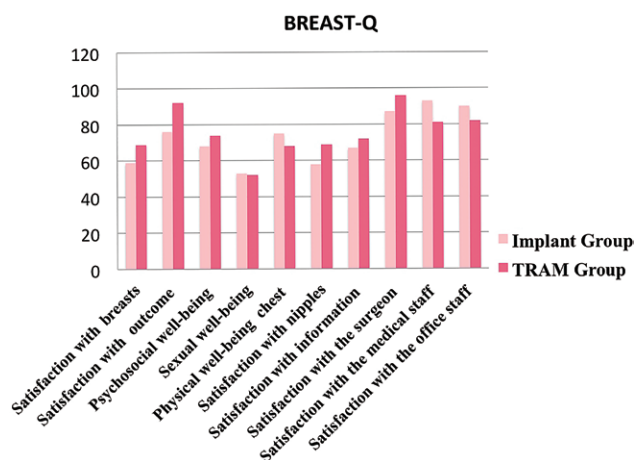
This cross-sectional study compared 2 cohorts in which 34 (52.3%) women underwent mastectomy and successful breast reconstruction with implants and 31 (47.7%) women underwent mastectomy and successful breast reconstruction with autologous tissue (free TRAM flap). Mean age of patients was 51.2 years in free TRAM group and 58.9 years in implant group. Twenty-four (70.5%) patients from the free TRAM group and 12 (38.7%) patients from the implant group underwent radiotherapy. Three (8.8%) patients were smokers in free TRAM group compared with 5 (16.1%) patients in the implant group. The time interval between the operation and filling of the questionnaire was 12 to 48 months (average, 31 months). Data analysis demonstrated that women with autologous breast reconstruction were significantly more satisfied with their breasts ( $P = 0.0003$ ) and with the overall outcome ( $P = 0.0001$ ) compared with women with implant breast reconstruction (Figs. 1, 2). Results of the analysis of the patient-measured outcomes within all 10 modules are presented in Figure 1.

## DISCUSSION

The decision-making process of a patient undergoing breast reconstructive surgery after mastectomy is very complex. In today's medical climate, patient satisfaction

| BREAST-Q                            | Implant Group (SD) | TRAM Group (SD) | <i>p</i>       |
|-------------------------------------|--------------------|-----------------|----------------|
| Satisfaction with breasts           | 59.3(11.8)         | 69.1(6.2)       | <b>0.0003*</b> |
| Satisfaction with outcome           | 75.5(16.6)         | 91.5(10.8)      | <b>0.0001*</b> |
| Psychosocial well-being             | 67.6(20.5)         | 73.5(10.0)      | 0.1112         |
| Sexual well-being                   | 52.7(18.5)         | 51.7(6.8)       | 0.3736         |
| Physical well-being chest           | 75.1(13.4)         | 67.5(9.5)       | 0.0102         |
| Physical well-being abdomen         | -                  | 71.3(21.1)      | -              |
| Satisfaction with nipples           | 57.5(25.6)         | 69.0(21.4)      | 0.0742         |
| Satisfaction with information       | 66.8(16.1)         | 72.1(16.5)      | 0.2245         |
| Satisfaction with the surgeon       | 86.9(16.8)         | 95.5(7.6)       | 0.0202         |
| Satisfaction with the medical staff | 92.9(14.5)         | 80.8(20.1)      | 0.0171         |
| Satisfaction with the office staff  | 90.1(16.6)         | 81.5(18.0)      | 0.1190         |

**Fig. 1.** Means and SDs of the BREAST-Q patient-reported scores (\*statistically significant =  $P < 0.01$ ).



**Fig. 2.** Mean distributions comparing BREAST-Q patient-reported scores from the implant and TRAM groups.

has become an important variable used to establish quality of care parameters.

Through statistical analysis, our results showed that patients who underwent autologous tissue reconstruction appear to have better satisfaction with the reconstructed breast and the outcome, while both techniques appear to equally improve psychosocial well-being, sexual well-being, and chest satisfaction.

These data confirm previous reports in the literature, with a general consensus suggesting that patients whose breasts are reconstructed using autologous tissue are more satisfied.<sup>16,17</sup> Autologous tissue reconstruction offers many advantages that prosthetic devices cannot offer, including

longevity, predictability, and success in complex cases such as prior radiation or device infection, as well as providing the added benefit of esthetic recontouring at the donor sites. Autologous reconstruction has the benefit of replacing like with like. Despite requiring lengthier procedures and a longer recovery, autologous tissue-based reconstruction has the potential to recreate a soft, naturally ptotic breast shape that is ideal for matching an unaffected contralateral breast.<sup>18</sup>

The goal of reconstructive breast surgery is no longer to create a breast mound; instead, it aims to create a breast with a natural shape, volume, contour, and symmetry. The use of autologous tissues allows for reconstruction of a breast, which looks and feels more like a natural breast. Patient expectations after mastectomy and reconstruction have increased, and reconstructive plastic surgeons should continue to strive for excellence to satisfy them.

In a previous study published by Hu et al,<sup>19</sup> the authors stressed that both breast implant and autologous tissue reconstruction experience an “aging” process, resulting in different long-term complications that can variably influence the esthetic result. The authors noted that patients who underwent TRAM flap, compared with patients who underwent expander/implant reconstruction, showed greater long-term esthetic satisfaction. The satisfaction reduction in patients who underwent breast reconstruction using an expander/implant could be related to the high incidence of complications and reoperations required for this technique.<sup>20</sup> Women who undergo reconstruction using silicone gel implants have up to a 28%<sup>21,22</sup> risk of developing grade III or IV Baker capsular contracture and a 30% risk of having to remove or replace the prosthesis, resulting in an overall reoperation rate of 45% to 50%.

Although implant-based breast reconstruction remains the most common method utilized to reconstruct a breast after mastectomy for cancer, autologous tissue reconstruction is generally regarded the gold standard in breast reconstruction.<sup>23</sup> In any case, implant reconstruction has advanced through the years with better devices and improved surgical techniques. This is why the spectrum of patients suitable for implant-based breast reconstruction goes beyond the traditional concept of slim to moderately built women with modest breast size and minimal ptosis. In addition, the development of acellular dermal matrices and fat transfer techniques will further evolve for patients suitable for implant-based techniques.

Autologous breast reconstruction is an option for many women. The choice of breast reconstruction depends on multiple factors when selecting the best reconstruction option for a patient. One important consideration is the level of patient motivation and the willingness of the patient to undergo complex or extensive procedures. The magnitude of surgery, length of recovery, potential complications, resultant scarring, and potential functional loss associated with some forms of autologous breast reconstruction may be valid reasons for patients to opt for implant-based surgery.

Breast reconstruction should be tailored to meet the individual needs of the patients. The available options and decision-making process should be fully discussed in the setting of a balance of benefits and risks used in the final analysis of the patient's choice. Units that offer breast reconstruction should have access to the range of options in current practice for meeting these needs.

## CONCLUSIONS

Through statistical analysis, our results showed that patients who underwent autologous tissue reconstruction had better satisfaction with the reconstructed breast and the outcome, while both techniques appear to equally improve psychosocial well-being, sexual well-being, and chest satisfaction.

**Ondrej Mestak, MD, PhD**

Department of Plastic Surgery

Bulovka Hospital

1st Medical Faculty of Charles University in Prague

Budinova 2, Prague 8, 14800, Czech Republic

E-mail: mestak@gmail.com

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