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SCARS MAY INDEED "HAVE THE STRANGE POWER TO REMIND US THAT OUR PAST IS REAL":* A PATIENT REPORTED OUTCOME MEASURES STUDY IN WOMEN WITH POSTMASTECTOMY BREAST RECONSTRUCTION

İZLERİN GERÇEKTEN DE 'ENTERESAN BİR ŞEKİLDE YAŞADIKLARIMIZIN GERÇEK OLDUĞUNU BİZE ANIMSATMA GÜCÜ'* OLABİLİR: MASTEKTOMİ SONRASI MEME REKONSTRÜKSİYONU YAPILMIŞ KADINLARDA HASTA RAPORLU BİR SONUÇ ÇALIŞMASI

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ABSTRACT

Objective: One of the leading causes of death among women is breast cancer. The disease process and treatment journey consume patients' emotional and physical energy, severely affecting mood, self-esteem, body image, sexual functions, commitment, and overall quality of life. Postmastectomy breast reconstruction is known to revert some of these adversarial conditions. This study uses patient-reported outcome measures (PROMs) to investigate the factors influencing the end result and quality of life regarding postmastectomy breast reconstruction.

Material and Method: Thirty-four patients who'd undergone breast reconstruction filled out a questionnaire form including 54 questions pertaining the patients' surgical and oncological history, demographics, mood, self-esteem, body and breast self-image, social and familial support mechanisms, and satis-

ÖZET

Amaç: Meme kanseri kadınlar arasında önde gelen ölüm nedenlerinden biridir. Hastalığın seyri ve tedavisi hastaların duygusal ve fiziksel enerjisini tüketir ve duygu-durumları, özgüvenlerini, cinsel işlevlerini, yaşama bağlılık ve yaşam kalitelerini etkiler. Mastektomi sonrası meme rekonstrüksiyonu bu sorunların bir kısmının giderilmesinde yardımcı olabilir. Bu hasta tarafından raporlanan çıktı ölçütleri çalışmasında sonuçları ve hastaların yaşam kalitelerini etkileyen etmenler araştırılmıştır.

Gereç ve Yöntem: Meme rekonstrüksiyonu geçirmiş toplam 34 hasta cerrahi ve onkolojik öyküleri, demografik verileri, duygu-durumları, beden ve meme öz algıları, sosyal ve ailesel destek mekanizmaları ile yaşam ve rekonstrüksiyondan memnuniyetlerini sorgulayan 54 soruluk bir anket yanıtladı. Sonrasında

* Cormack McCarthy, novelist (in "All the pretty horses", 1992)

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faction with life and reconstruction. The study then collected anthropometric measurements and standardized photographs and had plastic surgery residents assess aesthetic outcome with regard to the photographs.

Result: Half of the patients had immediate while the other half had delayed reconstruction. Of the patients, 10 (29.4%) had reconstructions that only involved an implant, 15 (44.1%) had reconstructions that only involved autogenous tissue, and nine (26.5%) that had both. No significant association could be found for the reconstruction method or timing of the reconstruction with aesthetic results, symmetry, or patient satisfaction. Meanwhile, nipple-areolar complex (NAC) reconstruction contributed to significantly better aesthetic outcomes (p=0.026) and overall patient satisfaction (p=0.029). Scar issues were found to significantly affect satisfaction scores (p=0.008) while not affecting the aesthetic outcome.

Conclusion: Neither symmetry nor aesthetic outcome were found to be major factors influencing patients' overall satisfaction with breast reconstruction. However, scars are relevant as constant reminders of past surgeries. Another significant factor in patient satisfaction was NAC reconstruction.

Keywords: Breast, reconstruction, cancer, mastectomy, scars, nipple

antropometrik ölçümler ve standardize fotoğraflar alındı. Estetik sonuçları bu fotoğrafların üzerinden değerlendirildi.

Bulgular: Hastaların yarısına eş zamanlı, yarısına geç dönemde rekonstrüksiyon yapılmıştı. On hastaya (%29,4) sadece implant ile, 15'ine (%44,1) sadece otojen doku ile ve dokuzuna (%26,5) ikisi de yapılmıştı. Rekonstrüksiyon metodu veya zamanlamasının estetik sonuçlar, simetri veya hasta memnuniyetiyle aralarında anlamlı bir ilişki bulunamadı. Bununla beraber meme başı-areola kompleksi (MAK) rekonstrüksiyonu yapılmış olması hem estetik sonuçları (p=0,026), hem de hasta memnuniyetini (p=0,029) anlamlı derecede olumlu yönde etkilemişti. Ancak nedbe sorunları estetik sonuçları anlamlı derecede etkilemezken hasta memnuniyetini olumsuz yönde etkileyen tek etmen olarak ortaya çıkmıştır (p=0,008).

Sonuç: Meme rekonstrüksiyonunda memnuniyeti anlamlı ölçüde etkileyen etmenler arasında simetri ve estetik sonuç bulunmazken süreci kendilerine anımsatan nedbe sorunları bulunmuştur. Hasta memnuniyetini anlamlı derecede etkileyen bir diğer etmen ise MAK onarımı yapılmış olmasıdır.

Anahtar Kelimeler: Meme, rekonstrüksiyon, kanser, mastektomi, nedbe, meme başı

INTRODUCTION

Regarding cancer-related mortality, breast cancer stands as the most prevalent malignancy among women, second only to lung cancer (1). While the incidence of breast cancer is on the rise, mortality rates have seen a slight decrease in recent decades, attributable to advancements in screening methods and anticancer medications (1-3). Improvements in both overall survival and disease-free survival rates are accompanied by a growing interest in enhancing the quality of life.

With a lifetime risk of one in eight, breast cancer presents a devastating experience for affected women and their loved ones (4). The ominous diagnosis of cancer, the side effects of hormone therapy and chemotherapy, and various forms of mastectomy surgeries collectively impact affected women throughout the course of the disease, affecting their cognitive, sexual, and social identity (5-8). Reconstructive breast surgery is steadily gaining popularity thanks to the increased awareness of its benefits without any compromise on patient safety (9).

Patient satisfaction is influenced by five major sets of factors: 1) medical background (concomitant diseases, breast/body type, and age), 2) patient expectations (self/breast perception, social background, coordination with the surgical team, and education), 3) oncoplastic background (radiotherapy, chemotherapy, hormone therapy, disease stage, ablation technique), 4) reconstructive surgery (timing of reconstruction, technique used, donor site, complications, and pain), and 5) results (symmetry and aesthetic outcome). Several factors stand out in terms of influencing patient satisfaction following breast reconstruction, including the chosen reconstruction technique, timing of the reconstruction, presence of complications, necessity for reoperation, patients' psychosocial backgrounds, body mass indices, and whether nipple-areolar complex (NAC) reconstruction was performed (10-12). While NAC reconstruction is often offered to patients following a removal due to oncologic surgery, it may also be loosely advertised in relation to breast mound reconstruction (13).

These factors, along with their pros and cons, should be thoroughly discussed with patients before undergoing oncologic surgery. The impact of reconstruction on patient satisfaction has been previously studied (14). This study uses patient-reported outcome measures (PROMs) to present the findings from a comprehensive questionnaire aimed at identifying the factors influencing overall patient satisfaction.

MATERIALS and METHODS

This retrospective study was approval from the Istanbul University, İstanbul Faculty of Medicine's Local Ethical Committee for Clinical Research (Date: 05.11.2023, No: 20). All patients participating in this study have undergone surgery conducted by the authors. The authors affirm that the operating techniques that were employed have been scientifically validated and are ethical. Furthermore, the authors confirm their compliance with the World Medical Association's Declaration of Helsinki

(1964), including its 7th revision (2013), thus ensuring adherence to ethical standards. Informed consent was obtained from all participants.

Patients and questionnaire

The study included patients who'd undergone breast reconstruction in our clinic between 2005 and 2009. A total of 48 eligible patients were identified, with 34 agreeing to participate. Face-to-face interviews covered psychosocial backgrounds; pre-disease, post-mastectomy, and post-reconstruction psychosexual statuses; mood; bodily perception; and self-esteem. The questionnaire comprises 55 questions categorized under demographics, disease and reconstruction history, physical examination, psychosocial status, familial and social support, perception of body and priorities, and overall satisfaction with subsidiaries (see the additional files section in the Appendix).

Of the patients, 17 underwent reconstruction at the same time as their oncologic surgery, while a later reconstruction approach was employed over the remaining 17. Selection criteria included women with a minimum nine-month follow-up post-reconstruction, which takes into consideration the significant tissue healing that occurred in the breast tissue during this period (15, 16). Patients provided written informed consent for the use of their medical and photographic data.

The retrospective data analysis covers demographic features; disease characteristics; psychological, social, and familial support mechanisms; patient expectations, and patient satisfaction. The analysis also assesses overall quality of life, emotional status, and sexual well-being, as drawn from the questionnaire. The analysis evaluates the impact of reconstruction type, timing, method, operations for contralateral breast, NAC reconstruction, resultant breast symmetry, aesthetic outcome, and complications (donor site morbidity, radionecrosis, capsule contraction, excessive scarring).

The same pollster conducted a face-to-face survey that involved measurements of height and weight; uniformity was ensured by scheduling interviews at the same time of day (midday, around 12:00 pm) to eliminate diurnal bias.

A Turkish translation of the modified Rosenberg Questionnaire Form was used to assess body self-image and self-esteem (17). The first subsidiary was used for its relevance to self-image. Self-respect levels were categorized as high (0-1 points), average (2-4 points), or low (5-6 points) based on the scoring scheme.

Responses were evaluated concerning the chosen reconstructive technique, complications, necessity for re-operation, and whether NAC reconstruction had been performed.

Assessment of the aesthetic outcome

Standard frontal and lateral photos obtained from 26 consenting patients were anonymized, double-copied, and randomly numbered. These images were presented twice in random order to 10 residents, who assessed the aesthetic outcome using a visual analog scale. Anthropometric analyses using ImageJ™ (NIH, Bethesda, MD, USA) digital software were also performed on these images. Resultant breast symmetry was assessed clinically and through a comparison of breast indices based on breast mound volume/thoracic volume utilizing a method proposed by Bicer et al. (18).

Statistical methods

For the statistical analysis SPSS ver. 22.0 (IBM Corp., Armonk, NY, USA) was used. Correlation analyses were carried out with Spearman's test. For the independent variables, group comparisons were made using Student's t-test for normally distributed data and the Mann Whitney U test for ordinal and non-normally distributed data. A Kruskal Wallis test for ordinal and non-normally distributed data and a one-way ANOVA test for normally distributed data were utilized when testing more than two groups. For the dependent variable analyses and for comparing paired samples, the dependent variable t-test was used for normally distributed dataset and the Wilcoxon signed-rank test for non-parametric comparisons. The Friedman test was utilized when addressing more than one time point. Post-hoc analyses were carried out using Tukey's test, the Mann-Whitney U test, or the Wilcoxon signed-rank test with Bonferroni corrections. Ratios were compared with the chi-square test when applicable or Fisher's exact test. The intraclass correlation coefficient (ICC) test was utilized to determine inter-observer reliability for the aesthetic scores, with the significance level being set at $p<0.05$.

RESULTS

Demographic data

The mean age of the patients (n=34) was 43.4 (±9.0). Four patients (11.7%) had in-situ lesions, while 28 patients (82.3%) had invasive lesions. Two patients (5.9%) had undergone a mastectomy for benign breast lesions. Sixteen patients (47.1%) had their right breast and 15 (44.1%) had their left breast removed. Three patients (8.8%) had bilateral pathology. Twenty-eight patients (82.4%) underwent modified radical mastectomies, while six (17.6%) underwent breast-sparing mastectomies. Table 1 summarizes the patients' demographic backgrounds.

Reconstruction methods

Half of the patients had their reconstruction at the time of their mastectomy surgery, while the other half received a delayed reconstruction. As for the reconstructive technique chosen, 10 (29.4%) had their reconstructions with the implant only, 15 (44.1%) with autogenous

Table 1: Patients' demographic characteristics

Age	43.4 (±9)
Age at diagnosis	40 (±8)
Body mass index	25.53 (±2.73)
Educational background	
Elementary school	5
Middle school	2
High school[a]	15
College/University	12
Occupation	
Housewife	12
Manufacturing	2
Service[a]	14
Retiree	6
Marital status	
Single	4
Married[a]	23
Divorced	7

a: Median value

tissue only, and nine (26.5%) with both implants and autogenous tissue. All the autogenous reconstructions were performed utilizing abdomen-based flaps (pedicled or free transverse rectus abdominis musculocutaneous flap, deep inferior epigastric artery perforator flap), except for one patient who had a superior gluteal artery perforator flap reconstruction and one whose reconstruction involved a freestyle perforator dermoglandular flap harvested from the contralateral breast. For the patients who underwent both autogenous and implant reconstructions, latissimus dorsi flaps (conventional musculocutaneous, open, or endoscopic) were used either to cover the implant or to increase the tissue bulk. Figure 1 exhibits the distribution of the reconstructive method undergone along with the timing, while Figure 2 exhibits the distribution of the method regarding whether pre-expansion of the breast pocket with a tissue expander had been used (Figures 1 and 2). Information on NAC reconstruction was relevant for 30 patients. At the time of the study, 12 (40%) had undergone NAC reconstruction, while 18 (60%) had not.

Complications

Six patients experienced serious complications related to the reconstructed breast, with necessity to reoperate being the determining factor for seriousness. For aesthetic reasons, 14 patients underwent revision surgeries (41.2%). Twelve patients (46.1%) had complications related to the

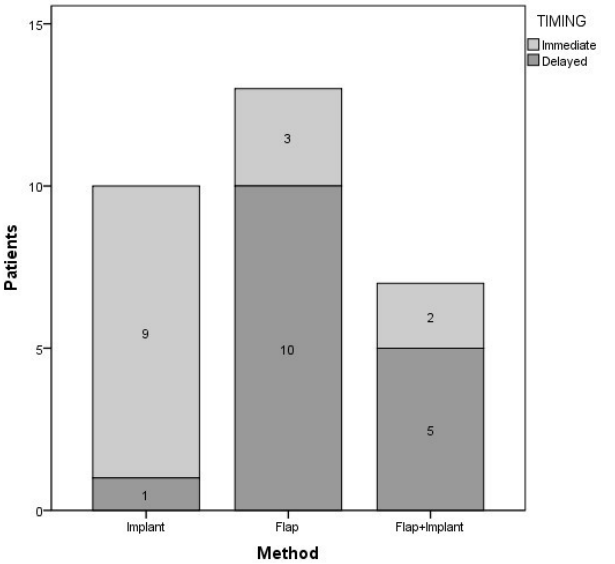

Figure 1: Patients are grouped according to timing and method of reconstruction.

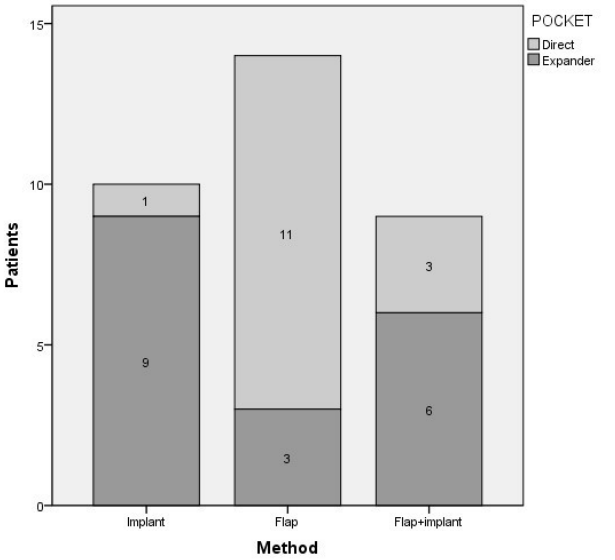

Figure 2: Patients are grouped according to pre-expansion with tissue expanders and method of reconstruction.

donor site, three had delayed wound healing (8.8%), nine patients had hypertrophic or atrophic scars (29%), one patient had an abdominal hernia (2.9%), and one patient experienced intractable pain at the donor site (2.9%).

Concerning the contralateral breast, 20 (5.8%) patients had contralateral breast surgery that included a reduction (n=10; 29.4%), augmentation (n=2; 5.8%), mastopexy (n=2; 5.8%), or mastectomy (n=6; 17.6%).

Social and familial support

With regard to the familial and social support questions,

five (14.7%) of the patients stated having inadequate familial support, 28 patients (82.4%) said it was adequate, and one patient (2.9%) stated it to be neither. All the patients stated receiving adequate support from the health care providers. Eleven patients (32.4%) stated that they had sought psychological help either from a psychiatry clinic or from a clinical psychologist, while 23 patients (67.6%) did not. Only five patients (14.7%) had joined a cancer support group during the disease process.

The patients' perceptions of their body and breast were found to be significantly higher than their perception of their breast image (p=0.011; Figure 3).

Factors affecting the outcome (satisfaction, symmetry, and aesthetic scores)

The type of mastectomy was not found to significantly affect overall patient satisfaction (p=0.727), aesthetic outcomes (p=0.166), or symmetry scores (p=0.208).

An excellent degree of reliability was found among the residents' aesthetic scores. The average ICC measurement was 0.958 (95% CI [0.931, 0.978]; p<0.001).

Having been treated with radiotherapy was associated with more frequent complications (p<0.001). However, neither radiotherapy (p=0.109) nor chemotherapy (p=0.523) significantly affected the aesthetic outcomes.

No significant association could be found between the timing of reconstruction and aesthetic results (p=0.538), symmetry (p=0.443), or patient satisfaction (p=0.830). Likewise, the reconstruction method (autogenous, implant, or both) was not found to affect aesthetic results (p=0.376), symmetry (p=0.205), or patient satisfaction (p=0.963).

As for NAC reconstruction, it contributed to significantly better aesthetic outcomes (p=0.026) and overall patient satisfaction (p=0.029).

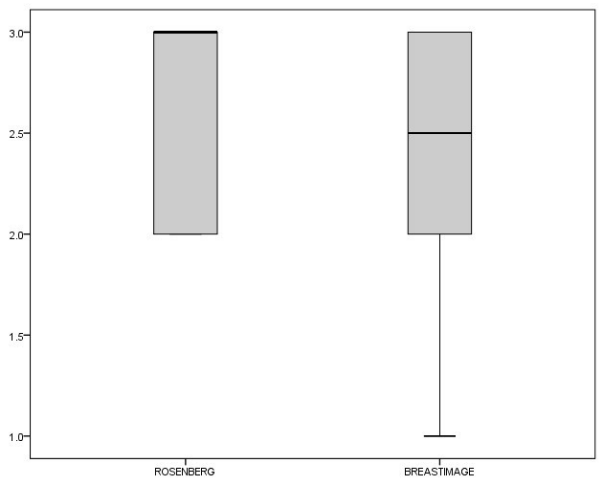

Figure 3: Patients' overall self-image was significantly better than their self-image of breast beauty (Wilcoxon signed-rank test, p=0.011).

Donor site morbidities were not found to be associated with significantly worse aesthetics (p=0.872) or satisfaction scores (p=0.187). However, scar issues were found to be the sole factor significantly affecting overall satisfaction scores (p=0.008) without significantly affecting the aesthetic outcome (p=0.757). Table 2 provides a summary of the factors that might influence satisfaction, aesthetic scores, and symmetry.

The patients described no change in their commitment to life throughout the disease and reconstruction processes (p=1.00). Their overall mood was found to be significantly improved after reconstruction (p=0.04). As for their sex life, patients experienced a decline after their cancer had been diagnosed and their breasts had been removed (p=0.007). However, no significant difference in their intercourse frequency could be found between the pre-diagnosis and post-revision periods (p=0.020, with significance being reset to 0.008 as per the Bonferroni correction while performing the pairwise post-hoc comparisons). Figure 4 presents the change in patients' sexual well-being (in terms of activity) throughout the disease and reconstruction processes.

DISCUSSION

The patients' average age (43.4) was found to be below the average age for mastectomies in the population. However, this average is comparable to the average age of patients who've undergone breast reconstruction (19). Rodby et al. found the average age for undergoing breast reconstruction to be 47 in the Caucasian population, 45.2 in the African American population, and 47.9 in the Hispanic population in their review study focusing on ethnic trends in breast reconstruction (20). Even in industrialized countries women requesting breast reconstruction tend to be younger than those who do not.

Working or retired workers comprised 64.7% of this study' patients. Due to the labor participation rate in an urban population in Turkey being 27.6%, women seeking breast reconstruction were found to be more likely to be involved in the workforce (21). Along with the female labor participation, the reverse pyramid seen in the education level of the women who participated in the study can be seen as another indicator that socioeconomic development level is a major factor for patients seeking or simply having the means to access breast reconstruction options.

Flap-related complications were seen in 16% of the patients, 25% of which resulted in flap loss necessitating proceeding with a salvage flap. The overall flap survival rate of 96% was found to be slightly higher than in the literature (22, 23). However, implant reconstructions result-

Table 2: Patient features with a potential to influence the outcome of breast reconstruction

	n (%)	Satisfaction score		Symmetry score		Aesthetic score	
Mastectomy type							
Breast sparing	6 (17.6%)	4 (IQR: 1)	p=0.727[a]	0.93 (IQR: 0.12)	p=0.208[a]	5.16 (±0.66)	
Modified radical mastectomy	28 (82.4%)	5 (IQR: 2)		0.85 (IQR: 0.27)		4.13 (±1.33)	
Radiotherapy							
Yes	12 (37.5%)	4 (IQR: 2)	p=0.381[a]	0.95 (IQR: 0.17)	p=0.317[a]	3.63 (±1.60)	p=0.109[b]
No	20 (62.5%)	5 (IQR: 3)		0.86 (IQR: 0.29)		4.56 (±1.10)	
Chemotherapy							
Yes	20 (60.6%)	5 (IQR: 2)	p=0.883[a]	0.86 (IQR: 0.29)	p=0.931[a]	4.44 (±1.61)	p=0.523[b]
No	13 (39.3%)	4 (IQR: 2)		0.89 (IQR: 0.28)		4.12 (±0.79)	
Timing							
Immediate	17 (50%)	4 (IQR: 2)	p=0.830[a]	0,83 (IQR: 0.25)	p=0.443[a]	4,18 (±0.99)	p=0.538[b]
Delayed	17 (50%)	5 (IQR: 2)		0.94 (IQR: 0.23)		4.51 (±1.59)	
Technique							
Autogenous	15 (44.1%)	4 (IQR: 3)	p=0.963[c]	0.94 (IQR: 0.19)	p=0.205[c]	4.88 (±1.57)	p=0.376[d]
Implant	10 (29.4%)	4 (IQR: 2)		0.74 (IQR: 0.28)		3.79 (±0.94)	
Implant+autogenous	9 (26.4%)	5 (IQR: 2)		0.85 (IQR: 0.27)		4.56 (±1.02)	
Recipient site preparation							
Direct	16 (47%)	5 (IQR: 2)	p=0.860[a]	0.94 (IQR: 0.19)	p=0.149[a]	4.85 (±1.51)	p=0.400[b]
Expander	18 (53%)	4 (IQR: 2)		0.85 (IQR: 0.28)		4.13 (±0.97)	
Nipple-areolar complex							
Not reconstructed	18 (60 %)	3 (IQR: 2)	**p=0.029[a]**	0.83 (IQR: 0.32)	p=0.250[a]	3.98 (±1.11)	**p=0.026[b]**
Reconstructed	12 (40 %)	5 (IQR: 1)		0.91 (IQR: 0.17)		4.98 (±1.20)	
Complications							
Scar problems	9 (29%)	3 (IQR: 1) **p=0.008[a]**		0.87 (IQR: 0.18) p=0.949[a]		4.84 (±1.14) p=0.757[b]	
Flap problems	4 (17.3%)	5 (IQR: 1) p=0.599[a]		0.95 (IQR: 0.02) p=0.233[a]		4.87 (±2.20) p=0.436[b]	
Donor site issues	12 (46.1%)	4 (IQR: 1) p=0.187[a]		0.90 (IQR: 0.16) p=0.191[a]		4.48 (±1.28) p=0.872[b]	
Implant problems	6 (33%)	4 (IQR: 2) p=0.817[a]		0.91 (IQR: 0.17) p=0.673[a]		4.39 (±0.76) p=0.702[b]	

a: Mann-Whitney U test, b: Two-samples t test, c: Kruskal-Wallis test, d: One-way ANOVA test
Statistically significant results are emphasized in bold print. Bu cümle ikici satıra kaydırılsın

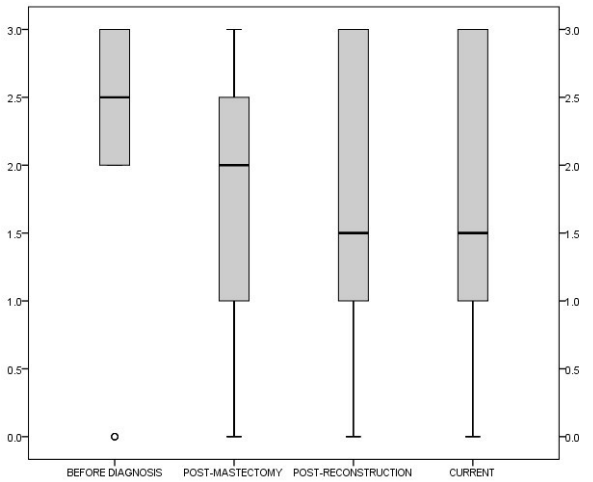

Figure 4: Patients experienced a decline after their cancer had been diagnosed and their breast(s) removed (Student's t test, p=0.007). However, no significant difference in their sexual intercourse frequency could be found between the pre-diagnosis and post-revision periods (ANOVA, p=0.020; significance was reset to 0.008 as per the Bonferroni correction while performing the pairwise post-hoc comparisons).

ed in serious complications in 24% of the patients. The reoperation rate with implant-based reconstructions was higher (16% vs. 24%). On the other hand, donor site morbidity and scar problems were mostly seen in patients who'd undergone autogenous reconstruction.

The patients exhibited a high perception of self-image, making this a pivotal factor in their decision-making process for reconstructive surgery. However, their self-image regarding breast appearance was comparatively lower, possibly influenced by the hindsight bias associated with the breast cancer diagnosis, leading some patients to associate their breasts with the cause of cancer.

Upon investigating the effects of reconstruction on patients' psyche, 88.2% reported a positive impact on their overall mood. Reconstructive surgery has been well established to be able to alleviate the negative emotional impact resulting from organ loss and the psychological burden of a cancer diagnosis (24-26). The main psychosocial drivers for women seeking reconstruction were identified as regaining self-image, eliminating external prosthetics, and a sense of regaining what had been lost (24).

Family bonds were found to be the main social support mechanism for the women in our study (82.4%). While social support is acknowledged as an effective tool in alleviating cancer-related stress and enhancing emotional well-being and self-esteem, access to support groups was notably low at 14.7% (25, 27, 28). This finding aligns with studies indicating varied preferences for social support groups among women from different countries and ethnic groups (29).

Regarding the four time points (i.e., pre-cancer diagnosis, post-mastectomy pre-reconstruction, post-reconstruction, and post-final revisions), patients noted a significant decline in the quality of their sex life which they attributed to the mutilating effects of the mastectomy compounded by radiotherapy, chemotherapy, and hormone therapy. With breast reconstruction, however, the patients reported a recovery to pre-cancer diagnosis levels over time, highlighting the positive impact of reconstruction (30, 31).

Among the factors determining patient satisfaction, NAC reconstruction and scar issues emerged as significant influencers. Notably, scar issues significantly affected patient satisfaction, contrary to patients' expectations, as only 11.8% had considered the absence of scar issues among their priorities. This discrepancy emphasizes the importance of addressing scar-related concerns during the reconstructive surgery decision-making process (32, 33).

The study revealed only 40% of the patients in our group to have opted for NAC reconstruction, with this factor significantly influencing patient satisfaction, which is in line with the existing literature (13, 34-36). Strikingly, scar issues also played a pivotal role in affecting patient satisfaction, emphasizing the significance of careful consideration and management of scarring issues in breast reconstruction. These findings concur with the current literature, which has recently explored the problem more and more. This issue is especially important as one of the most appreciated aspects of breast reconstruction, with abdomen-based flaps offering a bonus abdominoplasty (37). When patients are provided with the reconstruction options, they prefer abdomen-based flaps as they consider the donor site to be a dispensable bulk of tissue (38). However, this also yields the worst outcomes in terms of scar location (38). Even the more conspicuous scars of latissimus dorsi flaps were found to be preferable in a comparative study (39). This discrepancy can be explained by the differences in the tissue excised between abdomen-based flaps and abdominoplasty. In a study comparing the scar perceptions regarding abdominoplasty, conventional abdominal free flap harvest, and a hybrid approach, Li et al. found the hybrid approach to yield results comparable to abdominoplasty, both of which were significantly better than that of the conventional flap harvest (38). Reasonable explanations for this finding may involve how the high-riding scar placement includes sizable perforators located superior or around the umbilicus, as well as an inevitable undue tension at the suture lines due to the need for as much soft tissue as possible. The hybrid approach seems to circumvent this through the addition of an implant.

Neither timing nor method of reconstruction were found to influence patient satisfaction or aesthetic outcome. Although these findings appear a little controversial, they are in harmony with the results of similar studies (32). While autogenous abdominal-based options outweigh implant-based techniques regarding patient satisfaction rates, this trend tends to wane over time, thus diminishing any difference among groups (12, 40, 41).

Although the effects of NAC reconstruction on patient satisfaction could not be proven statistically, this factor was found to significantly influence the aesthetic outcomes. Another factor influencing this aspect was found to be radionecrosis. In this study, we found the presence of radionecrosis to significantly affect the aesthetic outcome.

This study has been able to make a detailed analysis of the outcome of breast reconstruction surgery. Patients seeking reconstruction have been able to be demographically profiled and their expectations from life, perception of body image, and mood mapped in detail.

The study's limitations include not being able to use comprehensive forms specifically targeting breast surgery, such as the Breast Reduction Assessed Severity Scale (BRASS), or BREAST-Q. However, BRASS is specific to breast reduction and not reconstruction, so its use was not warranted (42). Meanwhile, BREAST-Q has a module specifically targeting breast reconstruction (43). However initial reports with BREAST-Q were first published in 2009. Moreover, it was not translated into Turkish until recently, and our patients in this study had been polled before the this adapted form was introduced. We instead used a non-validated but nevertheless comprehensive form we invented. Future studies using the assessment scales mentioned above should be conducted to verify our results. Additionally, our survey was conducted after the cancer diagnosis, mastectomy, reconstruction, and their revisions had been experienced. A clearer image of these patients' psyches can be drawn if these surveys had been conducted before initiating treatment. Another shortcoming involves the limited number of patients in the study.

CONCLUSION

Every day, many women unfortunately face the diagnosis of breast cancer. Besides an undeniable sense of apprehension and fear for their lives, most of them have to undergo mastectomies, chemotherapy, radiotherapy, and hormonal therapy. Most of these therapeutic interventions alone or in combination are capable of damaging one's self-esteem, sense of self, sexuality, mood, commitment to life, and joy. Breast reconstruction is an integral part of the healing process. The appearance of the reconstructed breast may not be as important for the patients as the scars that remind them of their bitter past with cancer. Gaining insight into the expectations of women prior to undergoing reconstruction and listening to those who have already experienced the process are crucial steps in customizing a thoughtful and intentional approach to reconstruction.

Ethics Committee Approval: This study was approved by Istanbul University İstanbul Faculty of Medicine's Local Ethical Committee for Clinical Research (Date: 05.11.2023, No: 20).

Informed Consent: Informed consent was obtained from all participants.

Peer Review: Externally peer-reviewed.

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Appendix

ADDITIONAL FILE LEGENDS

Additional file. This survey contains 55 questions pertaining to the patients' demographic data, history, social and familial support, mood, sexual well-being, self-image, and satisfaction.

ADDITIONAL FILE

Additional File
Date:
Pollster:

DEMOGRAPHICS	
1. Name, Surname	
2. Age	
3. Occupation	
4. Marital Status	
5. Education Status	
6. Address	
7. Contact Number	
8. Height, Weight	

MEDICAL HISTORY-1				
9. Date of cancer diagnosis				
10. Diagnostic history	**10a.** Institution			
	University	Public	Private	
	10b. Mode of diagnosis			
	Self	Routine screening	Other	
	10c. Side			
	Right		Left	
	10d. Tumor location			
	Upper medial	Upper lateral	Lower medial	Lower lateral
11. Tumor type				
12. Mastectomy	Breast preservation	Skin preservation	Radical	
13. Axillary dissection Sentinel lymph node biopsy (SLNB)	+		-	
	SNB+	SLNB -	SLNB +	SLNB -
14. Chemotherapy	Yes		No	
15. Tamoxifen	Yes		No	
16. Radiotherapy	Yes		No	
17. Paramedical	Yes Type/Agent		No	
18. Prophylactic Mastectomy	Yes		No	

MEDICAL HISTORY-2		
19. Concommitant disease	Yes	No
	Type	
20. Menopause Status	Yes	No
	20a. Duration	
	20b. At time of diagnosis	
	Yes	No
	20c. Hormone replacement	
	Yes	No
21. Parity Status	**21a.** Number of children	
	21b. Age at first birth	
	21c. Birth method	
	C/S	Normal
	21d. Desire to have children	
	Present	Not present
22. Breast size before mastectomy	Cup: Size:	
23. Weight before mastectomy		

FORM 2

RECONSTRUCTION HISTORY				
24. Operator				
25. Timing	Simultaneous		Delayed	
26. Reconstruction	**26a.** Implant Expander, then implant			
	26b. Flap Expander ( ), latissimus dorsi and implant ( )			
	Open		Endoscopic	
	Expander ( ), Pedicled TRAM, implant ( ), delay ( ), muscle sparing ( )			
	Ipsilateral		Contralateral	Bilateral
	Expander ( ), Free TRAM, implant ( ), muscle sparing ( ), delay ( )			
	IMA		TDA	
	Expander ( ), Free DIEAP, implant ( )			
	IMA		TDA	
	Expander ( ), Free SGAP, implant ( )			
	IMA		TDA	
27. Revisions	**27a.** Flap Revision Timing Number **27b.** Fat grafts Timing Number **27c.** NAR ( ) Timing Number			

28. Contralateral breast	**28a.** Reduction ( ) Timing Technique Mastopexy ( ) **28b.** Augmentation ( ) Timing			
29. Complications	**29a.** Implant related			
	Capsule formation Rippling		Exposition, extrusion Infection	
	Solution			
	29b. Flap related			
	Total Flap Loss		Partial Loss	
	Arterial	Venous	Arterial	Venous
	Solution **29c.** Donor site morbidity Wound problems Solution Scar problems Solution Hernia, bulging Solution Contracture Solution Other Solution **29d.** Systemic complications **29e.** ICU Stay ( )			

PHYSICAL EXAMINATION			
30. Breast type	Glandular	Tuberous	Lipomatose
31. Scar	Atrophic		Hypertrophic
32. Radionecrosis			
33. Aesthetics			

FORM 3

PSYCHOSOCIAL			
34. Affective state before diagnosis	Good	Medium	Low
35. Psychiatric illness before diagnosis	Present	Non-present	
36. Overcoming the stress of diagnosis	Within a year		
	1-2 years		
	>2 years		
37. Current affective state	Good	Medium	Low
38. Effect of reconstruction on affective state	Positive		
	Negative		
39. Commitment to life before diagnosis	Good	Medium	Low
40. Commitment to life (current)	Good	Medium	Low

41. Awareness method for breast reconstruction	Oncologic team		
	Support groups		
	Breast Cancer Foundation of Turkey	The Turkish Federation of Breast Diseases Societies	
	Relatives		
	Media		
	Internet/Research		
42. Paternalism vs self-determining medical process	Self-determined		
	Paternalised		
43. Sexual well being	**43a.** Before diagnosis		
	Good	Medium	Low
	43b. Before reconstruction after mastectomy		
	Good	Medium	Low
	43c. Before final revision after reconstruction		
	Good	Medium	Low
	43d. After final revision		
	Good	Medium	Low

SUPPORT		
44. Family	Satisfactory	Not satisfactory
45. Medical personnel	Satisfactory	Not satisfactory
46. Psychiatry	Consulted	Not consulted
47. Support groups	Breast Cancer Foundation of Turkey	
	The Turkish Federation of Breast Diseases Societies	
	Other	

(PERCEPTION OF BODY AND PREDISPOSITIONS)

48. Body image, RBSO	Good	Medium	Low
49. Body image before diagnosis	Good	Medium	Low
50. Expectations	Likeness to unaffected breast		
	Larger than unaffected breast		
	Smaller than unaffected breast		
51. Predispositions	Scar problems, and lack thereof		
	Form of reconstructed breast without clothing		
	Form of breast with a dress		
	No aesthetic predispositions, just regaining what was lost		

SATISFACTION		
52. Are expectations met after final revisions?	Largely	
	Some	
	Near to none	
53. Overall satisfaction	Yes	No
	* Scars ( ), Form/aesthetics ( ), Size Large ( ), Size Small ( )	
54. Donor site content	Content	
	Discontent	
55. Offer breast reconstruction to others?	Yes	
	No, because…	