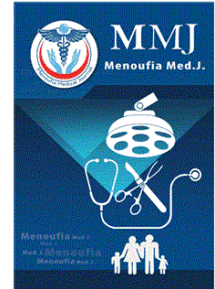




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ORIGINAL STUDY

Evaluation of Implant-based Immediate Breast Reconstruction

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Abstract

Objectives: To evaluate immediate breast reconstruction using silicone implant regarding: advantage, disadvantage, complications, and esthetic outcomes.

Background: Reconstruction after mastectomy allows women to mitigate some of the emotional and esthetic effects of this devastating disease. Although there are a variety of alloplastic and autologous techniques, they all aim to achieve the same objective: the successful reconstruction of a breast mound that appears as natural as possible.

Patients and methods: This study will be conducted on 19 patients at Department of General Surgery, Menoufia University and patients will be randomly selected.

Results: Among our studied patients, 31.6% developed postoperative complications after reconstruction. Among our studied patients seroma and minor infection were developed in 31.6% for each followed by lack of symmetry in 26.3 than unacceptable scar, pain in 21.1% for each then areola, depigmentation, restricted arm movement, numbness, or tingling in 15.8% for each then hematoma, and delayed wound healing in 10.5% for each. There was a significant improvement of EORTC Quality of Life Questionnaire C30 (QLQ-C30) 6 months after operation than before operation in the studied population.

Conclusion: Women who had breast reconstruction with implants were quite happy with the results and experienced minimal complications. Reconstructive surgery on the breast has been shown to substantially improve both patient satisfaction and quality of life. We were able to use BREAST-Q's evaluation of patient satisfaction to pinpoint areas where we might enhance our services.

Keywords: Breast reconstruction, Mastectomy, Plastic surgery, Quality of life questionnaire C30, Silicone implant

1. Introduction

Millions of women are diagnosed with breast cancer every year, and it commonly strikes at a young age [1]. Women who have undergone a mastectomy may be able to lessen the psychological and physical toll of treatment by opting for reconstructive surgery. Although there are a variety of alloplastic and autologous procedures available, they all have the same aim in mind: to successfully reconstruct a breast mound that looks normal with or without garments [1].

With the development of mastectomy and reconstruction methods, implant-based breast

reconstruction has progressed to provide outstanding results with both prepectoral and subpectoral implant implantation. Whatever the intended site of an implant may be, success and safety depend on careful patient selection and expert surgical technique [2].

After natural breast preservation (NSM) and scapulothoracic plication (SSM), the implants for instant implant-based breast reconstruction were first placed above the pectoralis major muscle to reconstruct the breast in its natural pocket (prepectoral positioning). However, initially this approach was linked to unacceptable rates of problems such as implant loss owing to epidermal

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necrosis or infection, implant exposure, and capsular contracture [3]. Placing the implant under the pectoralis major muscle has been shown to reduce the probability of problems during the treatment. One-stage direct implant placement has lately become routine therapy in several European nations, although the two-staged implant-based breast reconstruction (initial tissue expander implantation then swapped to implant) has been the typical technique [4]. Some have proposed using a prepectoral placement rather than a subpectoral one to lessen pain without increasing the risk of complications [5].

Because the implant is placed in a prepectoral position, the natural shape of the breast is preserved, and there is no need to make any incisions in the pectoralis major muscle, which can lead to a speedier recovery and a more natural esthetic result [6].

The aim of the study was to evaluate immediate breast reconstruction using silicone implant regarding: advantage, disadvantage, complications, and esthetic outcomes.

2. Patients and methods

This research was a prospective randomized trial that took place between January 2021 and January 2022 at Oncosurgery Unit, Menoufia University, and it included 19 patients with breast cancer. They have breast cancer for mastectomy. Their ages ranged from 18 to 50 years.

Patients in this study have undergone skin and nipple sparing mastectomy and immediate implant breast reconstruction.

The medical college's ethics board of Menoufia University gave its stamp of approval to this study. Patients' permission and consent were also obtained before publication. Ethical approval number was 3\2022 SURG 5.

Inclusion criteria were early stage breast cancer, women with small-to-medium-sized breasts, women with a family history of breast cancer who want to undergo preventive breast reconstruction and cases who have undergone a nipple or skin sparing mastectomy for operable breast cancer.

Exclusion criteria were age less than 18 years, cases with inoperable cancer breast, cases who did not wish to be a part of the study, smokers, and diabetic patients, patients with very small sized breasts or large mass size, and patients with nipple discharge or mass in behind the nipple cannot undergo nipple sparing mastectomy.

All patients were subjected to: making history (personal history, present history, past history, and family history), medical diagnosis (general

examination and breast local examination), preoperative preparation, surgical technique, and post-operative follow up.

Participants' personal information was kept private. No publication or report resulting from this study will include any information that may be used to identify the participants. Participants in this study were fully informed of the study's goals and procedures, as well as the potential benefits and drawbacks, before they enrolled. Informed consent was obtained.

Data was collected, registered for further statistical analysis. The analysis was done using Statistical Package for the Social Sciences (IBM SPSS, Inc. in Chicago, Illinois) software program (version 26). According to data results distribution; qualitative variables was recorded as frequencies and percentages and was contrasted with χ^2 test. The quantitative measure was presented as means \pm SD and was contrasted with Student *t* test. Correlation and regression analysis for the different variables was performed as indicated. *P* value less than 0.05 was significant.

3. Results

The current study included 19 patients; their age ranged among 34–67 years with mean value of 48.421 ± 9.465 years and their BMI ranged within 26–31 with mean value of 28.647 ± 1.431 . 36.8% needed neoadjuvant chemotherapy. 26.3% were stage T1, 36.8% were T2, 21.1% were T3, and 15.8% were N1. None of the patients developed local recurrence after breast reconstruction while isolated regional lymph node metastasis and distant metastases were developed in 5.3% (one case) for each (Table 1).

Table 1. Clinical characteristics, malignancy stage, and oncological safety after reconstruction in the studied patients.

Clinical characteristics	N = 19
Age (years)	
Range	34–67
Mean \pm SD	48.421 ± 9.465
BMI	
Range	26–31
Mean \pm SD	28.647 ± 1.431
Malignancy stage	n (%)
Neoadjuvant chemotherapy	
Yes	7 (36.8)
No	12 (63.2)
Oncological safety after reconstruction	N = 19
Stages	
T1	5 (26.3)
T2	7 (36.8)
T3	4 (21.1)
N1	3 (15.8)

The mean value of alveolar size before reconstruction was 5.295 ± 0.321 cm and after construction it was 3.411 ± 0.328 cm (Table 2).

Among our studied patients 31.6% developed postoperative complications after reconstruction. Seroma and minor infection were developed in 31.6% for each followed by lack of symmetry in 26.3 than unacceptable scar, pain in 21.1% for each then areola. Depigmentation, restricted arm movement, numbness or tingling in 15.8% for each then hematoma and delayed wound healing in 10.5% for each. Other complications included failure (loss of prosthesis), return to theatre for wound dehiscence, arm cellulitis, expander deflation, and hypertrophic scar were developed in 5.3% for each (Table 3).

EORTC (QLQ-C30) before operation of the studied population (Table 4).

There was significant improvement of EORTC (QLQ-C30) 6 month after operation than before operation in the studied population (Table 5).

Laboratory investigations of included patients, all were within normal range (Table 6).

4. Discussion

In Brazil, like in the rest of the globe, breast cancer is the main cause of cancer mortality among women. In Egypt, an estimated 59 700 women would be diagnosed with breast cancer in 2018–2019, making the rate of new cases 56.33 per 100 000 women. In 2018, it was predicted that there will be 2.1 million cases worldwide [7].

In this study we found that among 19 patients; their age ranged between 34 and 67 years with mean value of 48.421 ± 9.465 years and their BMI ranged within 26–31 with mean value of 28.647 ± 1.431 . Among our included patients 36.8% needed neo-adjuvant chemotherapy.

Martinez-López et al. [8] results showed that the average age of the group was 56 (SD = 14.2), the

Table 2. Patient satisfaction score and areola size before and after reconstruction in the studied patients.

Patient satisfaction score	N = 19
	Mean \pm SD
Satisfaction with breasts	64.789 \pm 2.936
Satisfaction with outcome	66.105 \pm 3.160
Psychosocial well-being	67.000 \pm 3.018
Sexual well-being	54.526 \pm 2.951
Physical well-being: chest and upper body	74.842 \pm 2.930
Areola size before and after reconstruction	N = 19
Areola size before (cm)	
Range	4.8–5.9
Mean \pm SD	5.295 \pm 0.321
Areola size after (cm)	
Range	2.9–4
Mean \pm SD	3.411 \pm 0.328

Table 3. Postoperative complications after reconstruction and esthetic outcomes of the studied patients.

	N = 19 [n (%)]
Postoperative complications after reconstruction	
Yes	6 (31.6)
No	13 (69.4)
Esthetic outcomes	N = 80 [n (%)]
Failure (loss of prosthesis)	1 (5.3)
Hematoma	2 (10.5)
Delayed wound healing	2 (10.5)
Return to theatre for wound dehiscence	1 (5.3)
Seroma	6 (31.6)
Minor infection	6 (31.6)
Arm cellulitis	1 (5.3)
Expander deflation	1 (5.3)
Hypertrophic scar	1 (5.3)
Areola depigmentation	3 (15.8)
Restricted arm movement	3 (15.8)
Pain in the treated breast	4 (21.1)
Feeling of numbness or tingling	3 (15.8)
Unacceptable scar	4 (21.1)
Lack of symmetry	5 (26.3)

Some patients developed more than one complication.

average weight was 68.75 kg (SD = 8.41), the average BMI was 29.2 (SD = 3.81), the average time among mastectomy and reconstruction was 30 (SD = 17.5) months, the average duration of the reconstruction process was 12.5 (SD = 5.3) months and the frequency of hazards was 13%.

In this thesis we found that among our studied patients none of them developed local recurrence after breast reconstruction while isolated regional lymph node metastasis and distant metastases were developed in 5.3% (one case) for each Biasio et al. [9] breast cancer cases who underwent implant breast reconstruction experienced no recurrence; at an 18-

Table 4. EORTC (QLQ-C30) before operation.

QLQ-C30	N = 19	
	Mean	SD
Functional scale		
Global health status	74.58	3.13
Physical functioning	97.53	4.65
Role functioning	88.89	3.90
Emotional functioning	64.58	3.13
Cognitive functioning	83.89	3.90
Social functioning	85.68	3.65
Symptom scales		
Fatigue	18.84	1.77
Nausea and vomiting	4.00	1.45
Pain	8.84	1.26
Dyspnea	5.00	1.45
Insomnia	26.21	3.57
Appetite loss	11.79	1.36
Constipation	4.37	1.01
Diarrhea	8.84	1.30
Financial difficulties	6.21	1.23

Table 5. EORTC (QLQ-C30) 6 months after operation.

QLQ-C30	QLQ-C30 before operation		QLQ-C30 6 months after operation		Independent Student <i>t</i> test	
	N = 19		N = 19		<i>t</i>	<i>P</i> value
	Mean	SD	Mean	SD		
Functional scale						
Global health status	74.58	3.13	56.95	3.19	16.699	<0.0001*
Physical functioning	97.53	4.65	79.89	5.30	10.559	<0.0001*
Role functioning	88.89	3.90	71.26	4.57	12.42	<0.0001*
Emotional functioning	64.58	3.13	46.32	3.82	15.653	<0.0001*
Cognitive functioning	83.89	3.90	65.63	4.94	12.281	<0.0001*
Social functioning	85.68	3.65	67.42	4.68	13.027	<0.0001*
Symptom scales						
Fatigue	18.84	1.77	11.16	1.80	12.857	<0.0001*
Nausea and vomiting	4.00	1.45	0.74	0.93	8.061	<0.0001*
Pain	8.84	1.26	4.16	1.26	11.37	<0.0001*
Dyspnea	5.00	1.45	2.26	1.52	5.437	<0.0001*
Insomnia	26.21	3.57	15.47	3.66	9.621	<0.0001*
Appetite loss	11.79	1.36	4.05	1.47	16.738	<0.0001*
Constipation	4.37	1.01	0.05	0.23	18.676	<0.0001*
Diarrhea	8.84	1.30	2.16	1.26	15.628	<0.0001*
Financial difficulties	6.21	1.23	3.47	1.35	6.31	<0.0001*

*Significant (*P* < 0.05).

month afterwards, they reported that 75.0% of women were very satisfied with their oncoplastic surgery, and that 70.3% reported excellent or good cosmetic consequences based on objective and subjective cosmetic evaluation.

Among our studied patients breast volume decreased after reconstruction in 52.6% and increased in 47.4%.

Fawzy et al. [10] hypothesized that several variables, such as traumatic graft handling, insufficient immobilization, hematoma, wound infection, poor vascularity of the implanted tissue, or large graft

thickness, contribute to the wide range of volume loss that might occur after implantation. Researchers found that the amount of resorption might be anything from 10 to 40%.

In this study we found that the mean value of alveolar size before reconstruction was 5.295 ± 0.321 cm and after construction it was 3.411 ± 0.328 cm.

In a comprehensive trial, Cordeiro et al. [11] evaluated the outcomes of implant-based IBR among 121 women who had been irradiated in the past and 1578 women who had not been irradiated.

Alveolar size were significantly lower after surgery compared with baseline (*P* < 0.05).

In this study we demonstrated that among our studied patients 31.6% developed postoperative complications after reconstruction.

Compared to a major research by Hughes et al. [12], which comprised 165 cases with immediate reconstructions and showed a 22% implant loss and 15% expander loss, as well as an overall complication rate of 57%, this rate was reduced.

In this thesis we found that there was a significant improvement of EORTC (QLQ-C30) 6 months after operation than before operation in the studied population.

Comparable to a study conducted by Chow et al. [13], patients who underwent implant-immediate breast reconstruction had a more positive assessment of their mental health. The results demonstrated that patients who underwent a mastectomy with primary breast reconstruction fared better than those who did not receive breast reconstruction in terms of psychosocial stress, impaired self-image,

Table 6. Laboratory investigations of the studied population.

	N = 19	
	Mean	SD
Hb (g/dl)	9.78	0.68
HCT%	37.42	3.79
RBC (× 10 ⁶ cell/mm ³)	4.85	0.64
WBC (× 10 ³ cell/mm ³)	6.05	1.03
Platelets (× 10 ³ cell/mm ³)	371.84	41.57
PT	22.79	2.10
PTT	31.29	2.10
INR	2.33	0.27
RBG (mg/dl)	94.26	20.07
Albumin (mg/dl)	3.21	0.25
Creatinine (mg/dl)	0.88	0.23
ALT (IU)	18.26	4.00
AST (IU)	15.05	3.99
pH	7.37	0.02
PCO ₂	34.26	4.00
PO ₂	94.00	7.71
HCO ₃	21.74	3.30

Laboratory investigations of included patients, all were within normal range.

and diminished sexual well-being and health-related quality of life.

Elder et al. [14] discovered that the majority of women were pleased with the immediate breast reconstruction and had improved emotional well-being, esthetic contentment with their body image, and surgical treatment completion.

Another large retrospective study by Al-Ghazal et al. [15] with a similar design found that lumpectomy or reconstruction was preferable to mastectomy alone in terms of both body image and psychosocial morbidity (anxiety, depression, and self-esteem).

Morzycki et al. [16] discovered that implant-based immediate breast reconstruction is associated with substantial alterations in breast, somatic, and sexual well-being satisfaction.

4.1. Conclusion

In conclusion, women who underwent breast reconstruction with implants reported high breast satisfaction and few side effects. Breast reconstruction is linked with a high satisfaction index and an enhancement in quality of life. BREAST-Q proved beneficial for evaluating case satisfaction and helped us identify areas where we could enhance our care.

Conflicts of interest

There are no conflicts of interest.

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