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Outcome Of Two-stages Tissue Expander Based Breast Reconstruction After Mastectomies

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ORIGINAL ARTICLE

The Outcome of Two-stage Tissue Expander-based Breast Reconstruction After Mastectomies

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Abstract

Background: **Breast reconstruction is now considered an essential aspect of breast cancer treatment rather than just a cosmetic technique. Around 65% of all breast reconstruction methods involve the use of tissue expanders (TEs) and implants. Tissue expander-based reconstructions have many benefits, including less time in surgery, a quicker recovery, and no morbidity at the donor site. In the event that a TE-based reconstruction fails, autologous breast reconstruction is still an option. Several books and articles have been written about tissue expander-based reconstruction, including its techniques, timeline, difficulties, and safety.**

Aim: **To evaluate the oncological safety and aesthetic results of two stages of breast reconstruction by using a tissue expander following a mastectomy operation.**

Patients and methods: **This prospective study included 20 patients presented by respectable breast cancer. All patients underwent surgery in Al-Azhar University Hospitals.**

Results: **The current study included 20 patients, most patients were stage T1. Among our studied patients 25% underwent immediate breast reconstruction while the remaining 75% have delayed breast reconstruction. Among our studied patients Seroma and Minor infection were developed in most patients.**

Conclusion: **The two-stage tissue expander based was safe and effective in breast reconstruction after mastectomies. The overall complication rate was 30%. Additional comparison research with bigger sample sizes and longer follow-up periods is required to corroborate our findings and identify adverse event risk factors.**

Keywords: Breast reconstruction, Mastectomies, Tissue expander

1. Introduction

In the United States, around 12.5% of women are diagnosed with breast cancer, making it the most common cancer among women globally.[1] Mastectomy techniques like nipple-sparing, skin-sparing, and skin-reduction mastectomies have evolved as breast cancer has become more readily detectable to doctors.[2] The loss of a breast can be a traumatic experience that severely diminishes a person's standard of living.[3] Women who have had a mastectomy and reconstruction report improved mental health and satisfaction with their appearance.[4] As opposed to only a cosmetic procedure, breast reconstruction is increasingly seen as a crucial component of breast cancer treatment.[5] TE/implant-based reconstruction accounts for approximately 65% of all breast reconstruction procedures in the United States due to its reputation as a safe, cost-effective, and trustworthy approach that can be performed on women with a variety of comorbidities.[6]

Even so, the advantages of tissue expander-based reconstructions over autologous breast reconstruction include a shorter surgical length, a speedier recovery, and no morbidity at the donor site.[7]

2. Patients and methods

This prospective study was included 20 patients with resectable breast cancer were treated by

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oncoplastic surgery (mastectomy followed by breast reconstruction by tissue expander either immediately in the same session or delayed which followed up for approximately three months until reaching the desired breast size and then replaced by silicone implant. All patients would undergo surgery in Al-Azhar University Hospitals. The Inclusion criteria were: Patients were only included in this study if they have breast cancer and are indicated for mastectomy (including stages T1,2,3 and N1) either with or without neoadjuvant chemotherapy. Exclusion criteria were patient with any of following: T4 breast cancer, N2 breast cancer, breast cancer that has spread(locally or distantly), medically incapable of undergoing surgery, Patients with histopathologist other than breast cancer were included if they consented to participation and provided informed consent.

2.1. Methods

This prospective study was undertaken in the hospitals of Al-Azhar University. 20 breast cancer patients with respectability were examined in this study.

Reconstruction by tissue expander either immediately in the same session or delayed which followed up for approximately 3 months until reaching the desired breast size and then replaced by silicone implant.

2.1.1. Clinical examination

Local Examination (Inspection, Palpation, Examination of the Nipples).

2.1.2. Diagnosing breast cancer

Diagnostic mammography, Ultrasound, and Biopsy (Fine needle aspiration biopsy, Core needle biopsy, Surgical biopsy, Image-guided biopsy, and Sentinel lymph node biopsy).

2.1.3. Investigation

Mammography, ultrasound, and Breast needle biopsy.

2.2. Surgical outcomes

Surgical outcomes were measured by factors such as time of surgery, blood loss, drainage fluid, and complications seen after surgery (infection, marginal necrosis of incision, dehiscence of incisions, upper limb lymphedema, bleeding, seroma, capsular contracture). Factors associated with adverse outcomes in breast reconstruction were analyzed.

2.3. Oncological outcomes

The duration of follow-up was counted backwards from the date of operation until the date of death due to postoperative complications or the final follow-up. Overall survival, overall disease-free survival, and disease-free survival without regional recurrence were calculated. The primary goal was disease-free survival (DFS).

2.4. Statistical analysis

The patient's medical history, first clinical examination, and outcome measures are coded, entered, and evaluated using Microsoft Excel. Statistical Package for the Social Sciences (SPSS) version 21.0 was used to analyze the data after it was imported (Statistical Package for the Social Sciences). Depending on the nature of the data (number and percentage for qualitative data, mean and standard deviation for quantitative data), the following statistical tests were employed to determine whether or not changes were statistically significant: Differentiation between qualitative groups using the Chi-square (χ^2) test, and comparisons using the *t*-test for quantitatively independent samples. Results were considered statistically significant when the *P* value was less than 0.05 and extremely significant when it was less than 0.001.

3. Results

Table 1.

Twenty patient participated in this study; their age ranged between 34 and 67 years with mean value of 49.000 ± 9.569 years and their BMI ranged between 26 and 31 with mean value of 28.590 ± 1.330. 40% of included patients need neoadjuvant chemotherapy (Tables 2 and 3).

The current study included 20 patients; 25% were stage T1, 40% were T2, 20% (Fig. 1).

Among our studied patients 25% underwent immediate breast reconstruction while the remaining

Table 1. The clinical characteristics of the studied population.

	$N = 20$
Age (Y)	
Range	34–67
Mean ± SD	49.000 ± 9.569
BMI	
Range	26–31
Mean ± SD	28.590 ± 1.330
	N (%)
Neoadjuvant chemotherapy	
Yes	8 (40%)
No	12 (60%)

Table 2. The malignancy stage of the studied population.

	$N = 20$ N (%)
Stages	
T1	5 (25%)
T2	8 (40%)
T3	4 (20%)
N1	3 (15%)

Table 3. The time to reconstruction after mastectomy in the studied population.

	$N = 20$ N (%)
Breast reconstruction	
Immediate e	5 (25%)
Delayed	15 (75%)
Time to reconstruction after mastectomy (mo) ($N = 15$)	
Range	6–12
Mean ± SD	8.867 ± 1.995

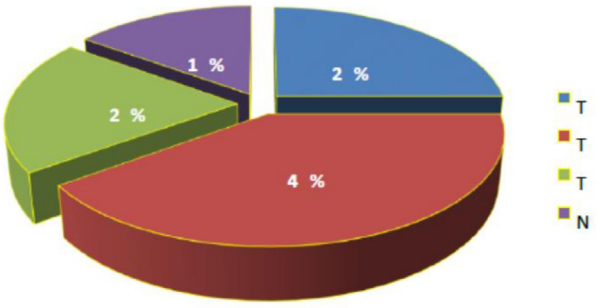

Fig. 1. Malignancy stage of the studied groups.

75% have delayed breast reconstruction for duration ranged between 6 and 12 months with average duration of 8.867 ± 1.995 months (Table 4).

Average size of final implant ranged between 340 and 800 g with average duration of 558.000 ± 128.947 g (Table 5).

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% (1 Case) for each (Tables 6 and 7).

Among our studied patients 30% developed postoperative complications after reconstruction (Fig. 2).

Among our studied cases Seroma and Minor infection were developed in 30% for each then Hematoma and Delayed wound healing in 10% of cases. Other complications included failure (loss of prosthesis), return to theatre for wound dehiscence, arm cellulitis, expander deflation and hypertrophic scar were developed in 5% for each (Figs. 3–5).

Table 4. The average size of final implant in the studied population.

	$N = 20$
Average size of final implant (g)	
Range	340–800
Mean ± SD	558.000 ± 128.947

Table 5. The oncological safety after reconstruction in the studied population.

	$N = 20$ N (%)
Local recurrence	
Yes	0
No	20 (100%)
Isolated regional lymph node metastasis	
Yes	1 (5%)
No	19 (95%)
Distant metastases	
Yes	1 (5%)
No	19 (95%)

Table 6. Postoperative complications in the studied population.

	$N = 20$ N (%)
Postoperative complications after reconstruction	
Yes	6 (30%)
No	14 (70%)

4. Discussion

Reconstruction of the breast after mastectomy continues to be major subspecialty of plastic surgery. The preference for prosthetic breast reconstruction over autologous breast reconstruction is growing due to its simplicity, dependability, and quick recovery McPherson and colleagues.[8] Subpectoral placement has historically been the

Table 7. The aesthetic outcomes of the studied population.

	$N = 80$ N (%)
Failure (loss of prosthesis)	
Yes	1 (5%)
No	19 (95%)
Hematoma	
Yes	2 (10%)
No	18 (90%)
Delayed wound healing	
Yes	2 (10%)
No	18 (90%)
Return to theatre for wound dehiscence	
Yes	1 (5%)
No	19 (95%)
Seroma	
Yes	6 (30%)
No	14 (70%)
Minor infection	
Yes	6 (30%)
No	14 (70%)
Arm cellulitis	
Yes	1 (5%)
No	19 (95%)
Expander deflation	
Yes	1 (5%)
No	19 (95%)
Hypertrophic scar	
Yes	1 (5%)
No	19 (95%)

NB, some patients developed more than 1 complications.

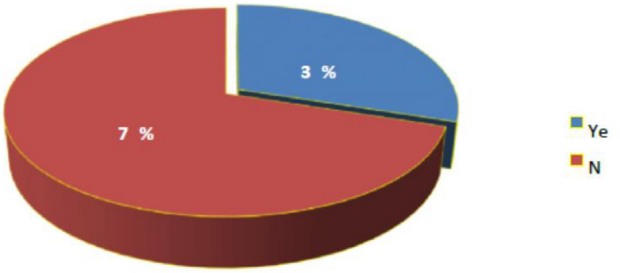

Fig. 2. Postoperative complications after reconstruction in of the studied.

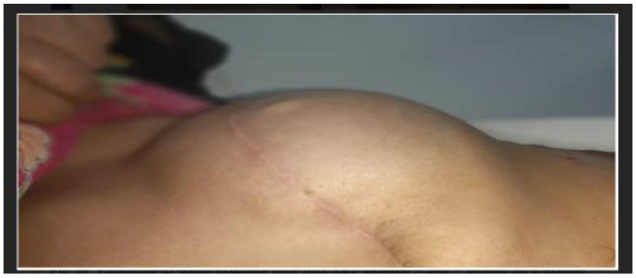

Fig. 3. The shape of the breast after full expansion by tissue expander (TE) and immediately before replacing TE by silicon prothesis.

procedure of choice for the vast majority of prosthetic device implantations Lamp and Lester.[9] The main results of this study were as follows:

Twenty patient participated in this study; their age ranged between 34 and 67 years with mean value of 49.000 ± 9.569 years and their BMI ranged between 26 and 31 with mean value of 28.590 ± 1.330. 40% of included patients need neoadjuvant chemotherapy. The current study included 20 patients; 25% were stage T1, 40% were T2, 20% were T3, 15% were N1.

In line with our study Park and colleagues[10] analyzed 653 immediate 2-stage breast reconstructions of 619 patients, with mean age 43.6 ± 7.2 years and mean BMI of 21.9 ± 2.7. 41% of included patients need neoadjuvant chemotherapy.

Similarly, Azouz and colleagues[11] evaluated the outcomes of immediate breast reconstruction utilizing direct-to-implant (DTI) single-stage and 2-stage tissue expanders in 50 cases with a mean BMI of 27.1 and a mean age of 49. 18% of included patients need neoadjuvant chemotherapy. The majority of the studied patients were stage 0 (67%) followed by stage 2 (13%).

Among our studied patients 25% underwent immediate breast reconstruction while the remaining 75% have delayed breast reconstruction for duration ranged between 6 and 12 months with average duration of 8.867 ± 1.995 months.

However, Kamel and colleagues[12] revealed that in the delayed group, the average time to complete autologous reconstruction was 25.9 months (SD = 10.4) while in the two stage group, it was 12.9 months (SD = 5.0).

The current study showed that the average size of final implant ranged between 340 and 800 g with average duration of 558.000 ± 128.947 g.

This was comparable with Lam and colleagues [13] who reported that the average final implant size for the non-radiation group was 492.5 g (range: 180–775) while for the radiotherapy group it was 452.5 g (range: 180–775) (range, 180–685). The average size was 8.1% smaller in the radiation group than in the nonradiotherapy group.

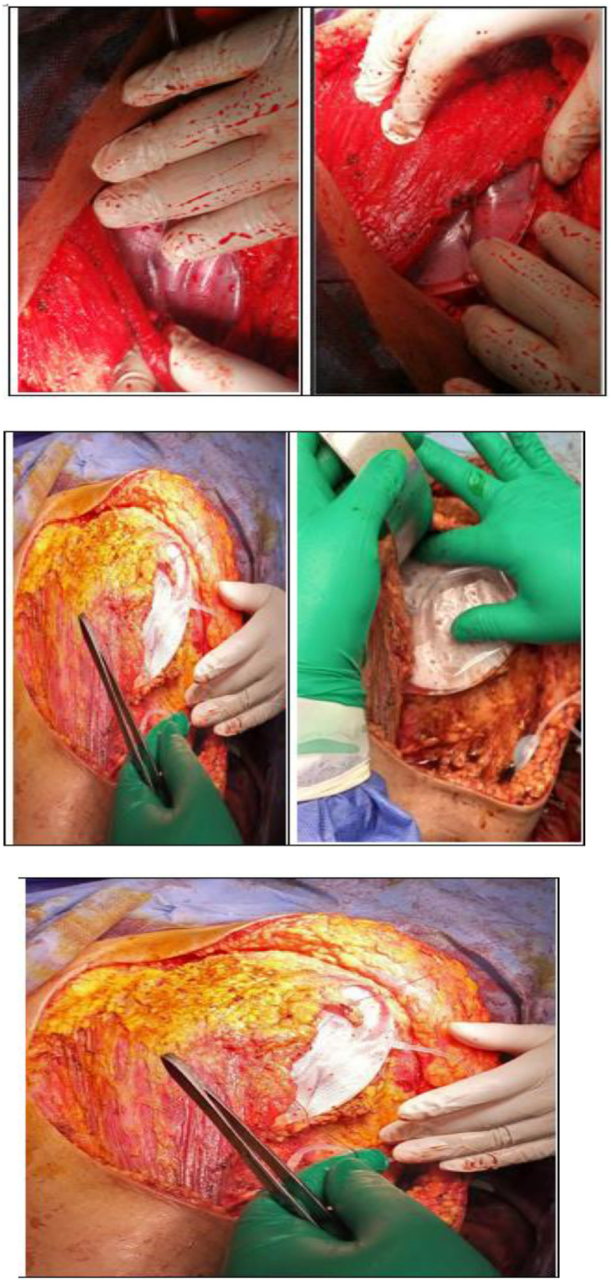

Fig. 4. During first stage either partial or complete submascular pectoral flab is created for insertion of tissue expander.

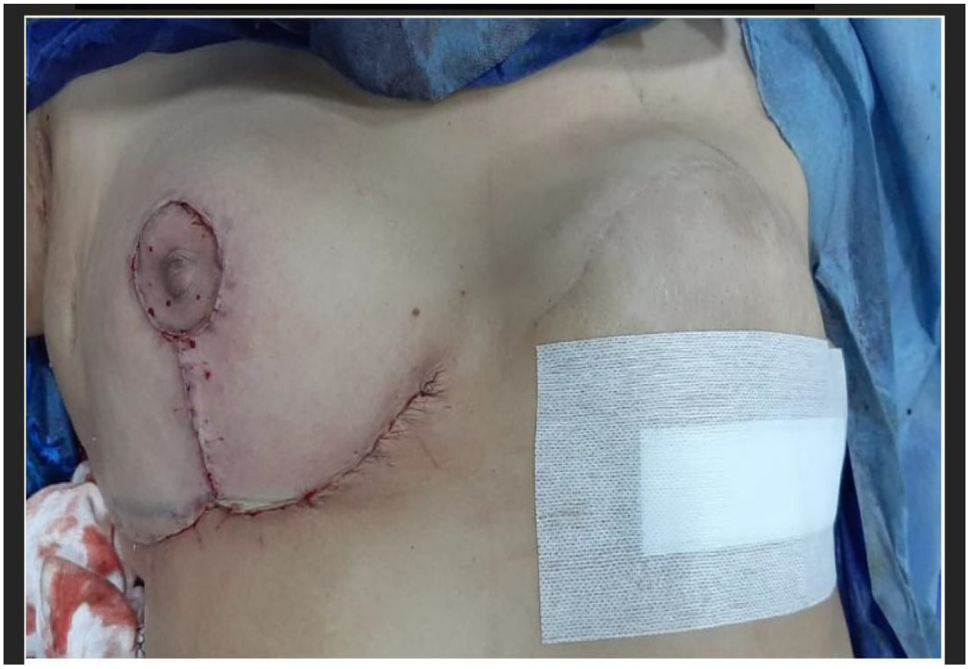

Fig. 5. One of our cases of 2 stages tissue expander based then silicon prothesis breast reconstruction on the Lt Side associated with Reduction mammoplasty on the Rt side to give symmetrical breast size on both sides.

Regarding postoperative complications in the studied population, we found that 30% developed postoperative complications after reconstruction. Among our studied patients Seroma and Minor infection were developed in 30% for each followed by Areola Depigmentation in 15% then Hematoma and Delayed wound healing in 10% of cases. Other complications included failure (loss of prosthesis), return to theatre for wound dehiscence, arm cellulitis, expander deflation and hypertrophic scar were developed in 5% for each.

However, Park and colleagues[10] reported an overall postoperative complication rate of 2.8% (18 of 653) and a revision surgery rate of 1%. (7 of 653 cases). Hematoma and skin flap complications were the most common complications. The difference between our results and those of other researchers may be due to differences in sample size and inclusion criteria.

While the study by Azouz and colleagues[11] found a substantial increase in total problems for patients in the two-stage group (40.5% vs. 28.2% in the direct-to-implant group; $P = 0.037$), the increase was not statistically significant. The two-stage group had significantly higher infection rates (34.2% vs. 13.7%, $P = 0.0022$). The majority of infections for both cohorts occurred within the first 30 days (two-stage, 83%; direct-to implant, 81%). The two-stage group had a greater rate of aesthetic revisions than the direct-to-implant group, although this difference did not reach statistical significance (52.9% vs. 38.5%, $P = 0.055$). Mastectomy skin flap complications such as seroma, hematoma, and necrosis were equally distributed amongst the two groups.

4.1. Conclusion

The two-stage tissue expander based was safe and effective in breast reconstruction after mastectomies. Among our studied patients 25% underwent immediate breast reconstruction while the remaining 75% have delayed breast reconstruction. Seroma and Minor infection were developed in most patients. The overall rate of complications was 30%. Further comparative research in studies with larger samples and longer follow-up is necessary to confirm our findings and uncover risk factors for adverse events.

Disclosure

The authors have no financial interest to declare in relation to the content of this article.

Conflicts of interest

The authors declared that there were No conflicts of Interest.

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