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# Skin Sparing Mastectomy and Direct-to-Implant: Oncologic and Aesthetic Outcomes

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## Abstract

**Background:** Breast reconstruction (BR) has long been acknowledged as a way to improve quality of life, enhance body image, and aid in the healing process after the psychological and emotional trauma of a mastectomy.

**Objective:** Assessment of the short-term oncologic and cosmetic results in breast cancer patients undergoing skin-sparing mastectomy and rapid implant reconstruction.

**Patients and Methods:** A comprehensive pre- and postoperative workup was performed on a total of 20 women who were candidates for skin-sparing mastectomy due to early-stage breast cancer, including patients whose cancer could be treated with a modified radical mastectomy. The interdisciplinary team discussed each patient to ensure that every possible course of treatment was considered for each individual. Metastatic workups, postoperative cosmetic results, and routine follow-ups were carried out.

**Results:** The mean  $\pm$  SD of psychosocial wellbeing according to breast Q satisfaction was  $78.52\pm 16.53$ ; postoperative breast satisfaction was achieved in  $69.75\pm 18.04$ ; postoperative implant satisfaction was achieved in  $67.75\pm 10.41$ ; physical wellbeing in the chest was reported in  $73.68\pm 16.23$ ; and sexual wellbeing was reported in  $69.05\pm 13.91$ .

**Conclusion:** An appropriate and secure course of treatment is a skin-sparing mastectomy combined with rapid subcutaneous implant reconstruction. Finding suitable patients and skin flap viability is essential to this strategy and getting the best results.

**Keywords:** Skin Sparing Mastectomy; Direct-to-Implant; Oncologic safety

## 1. Introduction

With almost 11.7% of all female cancer cases, breast cancer is the most often diagnosed cancer in the world for women.<sup>1</sup>

In Egypt, 38.8% of all malignancies in the population are breast cancers, making it the most frequent cancer among women. In 2020, there will likely be over 22,700 new instances of breast cancer.<sup>2</sup>

Several studies have demonstrated that following breast surgery, women with breast cancer had reduced sexual well-being or sexual dysfunction.<sup>3</sup>

Breast reconstruction (BR) has long been known to improve quality of life, enhance body image, and aid in the recovery from the psychological and emotional trauma of mastectomy.<sup>4</sup>

Thankfully, patient involvement in breast cancer treatment has increased, and the approach is now more patient-centred. A significant general advancement in healthcare is "shared decision-making," in which the

patient and the provider jointly decide on a course of action after careful consideration.<sup>5</sup>

The most popular method for restoring the breast mound and correcting postmastectomy defects is immediate implant-based reconstruction.<sup>6</sup>

Compared to the 2-step expander/implant reconstruction, single-stage direct-to-implant reconstruction has been demonstrated to minimize operating time, expense, and morbidity.<sup>7</sup>

Over the past ten years, direct-to-implant breast reconstruction has replaced two-stage surgery involving the implantation of tissue expanders, expansion, and implant exchange.<sup>8</sup>

While few studies have shown benefits for pre-pectoral implant breast reconstruction, the majority of publications primarily discuss two-stage tissue expander techniques.<sup>9</sup>

With that in mind, the purpose of this study was to assess the short-term oncologic and cosmetic results in women diagnosed with breast cancer who underwent skin-sparing mastectomy and rapid implant reconstruction.

## 2. Patients and methods

This prospective study was conducted from January 2022 to October 2023 at the Al-Azhar University Hospitals' Surgical Oncology Department, Faculty of Medicine. Women who met the following requirements were enrolled in the outpatient oncology clinic for follow-up.

Patients with early-stage breast cancer in the age range of 20 to 60 years old who had received preoperative neo-adjuvant radiotherapy or chemotherapy were included in the inclusion criteria. Additionally, patients who met the eligibility requirements for skin-sparing mastectomy included those whose cancer was medically suitable for a modified radical mastectomy.

Patients with active smoking habits, advanced disease, metastatic breast cancer, histopathology other than breast cancer, medical ineligibility for surgery, and those in need of a modified radical mastectomy from the beginning due to inflammatory breast cancer or recurrent breast cancer were among the excluded criteria.

Prior to the start of the study and any compliance with local regulations followed, the protocol and all related documents were declared for ethical and research approval by the council of the Surgical Oncology Department, Al Azhar University. After the nature, scope, and potential consequences of the clinical study had been explained in a way that they could understand, 20 patients consented to participate.

Patients were subjected, by the inclusion and exclusion criteria, to a comprehensive history taking of clinical importance, which included starting the consultation with the "Doctor," presenting the complaint and using open-ended questioning to explore the site, onset, character, radiation, associated symptoms, time course, exacerbating or relieving factors; severity; screening for other vital symptoms, including red flag features; and summarizing the patient's presenting complaint.

Bilateral mammography and breast ultrasonography were performed to differentiate between "lumpiness" brought on by a solid mass, a fluid-filled cyst, or a ridge of typical dense parenchyma. Breast magnetic resonance imaging was done "when needed" to find more tumour spots that were not suspected. Additionally, pelvic-abdominal ultrasonography was performed to look for any related abnormalities.

Although the aforementioned tests cannot replace histological confirmation, a needle biopsy is frequently performed on breast lesions that are clinically suspicious or focal solid lesions to make a diagnosis. Ultrasound guidance optimized the accuracy of targeting, and core biopsy replaced fine needle aspiration cytology.

The MDT talked with each patient to ensure

that all of their treatment options were considered.

The oncologic outcomes were surgical margins, tumor residual, adjuvant treatment delay, radiation impact, and locoregional recurrence. Furthermore, the aesthetic result was assessed using the Yale University School of Medicine's renowned Plastic Surgery Section's Core Curriculum.

The degree of satisfaction from the patient and the surgeon was evaluated using a grading system that included excellent, good, fair, and poor for the following factors: size, scars, NAC, symmetry, inframammary fold, implant edges, mobility, consistency, and overall cosmetic result. Changes in self-assurance, mood, body image problems, femininity, and sexual well-being were all considered psychological well-being. Ultimately, routine MDT follow-up was completed.



Figure 1 : Preoperative of a case of NSM

A preoperative of a case of NSM with radial incision, [Figure 1](#)



Figure 2 . post operative of a case of NSM

A postoperative of the same case of NSM with radial incision, [Figure 2](#)

Statistical Analysis

For numerical parametric data, descriptive statistics were performed as mean±SD (standard deviation) and minimum & maximum of the range; for numerical non-parametric data, they were performed as median and first & third inter-quartile range; and for categorical data, they were performed as number and percentage.

3. Results

*Table 1. Demographic data distribution among study group*

DEMOGRAPHIC DATA	NO.	%
AGE "YEARS"		
20-30 YEARS	2	10%
>30-40 YEARS	5	25%
>40-50 YEARS	9	45%
>50-60 YEARS	4	20%
RANGE [MEAN±SD]	20-60 [42.50±6.80]	
MARITAL STATUS		
MARRIED	16	80%
SINGLE	4	20%
CLASSIFICATION OF BMI		
NORMAL WEIGHT	5	25%
OVERWEIGHT	11	55%
OBESE	4	20%
RANGED OF BMI [MEAN±SD]	20-34 [27.58±3.92]	
SITE		
UNILATERAL	18	90%
BILATERAL	2	10%

[Table 1](#) shows that the ranged age was 20 to 60 with mean 42.50±6.80, while 16 patients (80%) and 4 patients (20%) were single among marital status, as for the classification of BMI, it was 5 patients (25%) were normal weight, 11 patients (55%) were overweight, and 4 patients (20%) were obese, while 18 patients (90%) were unilateral and 2 patients (10%) were bilateral.

*Table 2. Tumor distribution among study group*

TUMOR:	NO.	%
T		
T1	13	65%
T2	6	30%
T3	1	5%
N		
N1	16	80%
N2	4	20%
M		
M0	20	100%
M1	0	0%
PATHOLOGY		
I	4	20%
II	14	70%
III	2	10%
BIOLOGICAL TYPE		
NON INVASIVE	4	20.0%
BASAL LIKE	1	5.0%
HER2 ENRICHED	1	5.0%
LUMINAL A	12	60.0%
LUMINAL B	2	10.0%

[Table 2](#) shows that the T stage, it was 13

patients (65%) were T1, 6 patients (30%) were T2 and one patient (5%) were T3; also N, it was 16 patients (80%) were N1 and 4 patients (20%) were N2; while M, it was all patients 20 (100%) were M0; as for the Pathology, it was 4 patients (20%) were Grade I, 14 patients (70%) were Grade II and 2 patients (10%) were Grade III; additionally, there was Biological type, it was 4 patients (20.0%) were Non invasive, one patient (5.0%) were Basal like, one patient (5.0%) were Her2 enriched, 12 patients (60.0%) were Luminal A and 2 patients (10.0%) were Luminal B.

*Table 3. Breast Q satisfaction distribution among study group*

BREAST Q	RANGE	MEAN±SD	MEDIAN (IQR)
PSYCHOSOCIAL WELL BENIGN	36-100	78.52±16.53	84 (69-94)
SATISFACTION BREASTS (POST OP.)	15-100	69.75±18.04	73 (59-83)
SATISFACTION WITH IMPLANTS	30-100	67.75±10.41	70 (60-80)
PHYSICAL WELLBEING (CHEST)	29-100	73.68±16.23	77 (65-81)
SEXUAL WELLBEING	43-100	69.05±13.91	71 (60-77)

[Table 3](#) shows that Breast Q it was mean of Psychosocial well benign was 78.52±16.53, Satisfaction breasts (Post Op.) was 69.75±18.04, Satisfaction with implants was 67.75±10.41, Physical wellbeing (chest) was 73.68±16.23 and sexual wellbeing was 69.05±13.91.

*Table 4. Early complications distribution among study group*

EARLY COMPLICATIONS	NO.	%
NO	16	80.0%
YES#	4	20.0%
BLEEDING	2	10.0%
INFECTION	2	10.0%
FLAP NECROSIS	2	10.0%
HEMATOMA	1	5.0%
SEROMA	1	5.0%
SEVERE PAIN	1	5.0%

As shown in [Table 4](#), was 4 patients (20%) had early complications in the form of: 2 patients (10.0%) were Bleeding, 2 patients (10.0%) were Infection, 2 patients (10.0%) were Flap necrosis, one patient (5.0%) were Hematoma, one patient (5.0%) were Seroma and one patient (5.0%) were Severe pain.

*Table 1. Chemotherapy and Adjuvant radiotherapy distribution among study group*

CHEMOTHERAPY	NO.	%
NO	6	30.0%
NEOADJUVANT	7	35.0%
ADJUVANT	7	35.0%
ADJUVANT RADIOTHERAPY		
NO	9	45.0%
YES	11	55.0%

[Table 5](#) shows that the 7 patients (35%) received Neoadjuvant and 7 patients

(35%) received adjuvant among chemotherapy; while 11 patients (55%) received adjuvant radiotherapy.

*Table 2. Late complications distribution among study group.*

LATE COMPLICATIONS:	NO.	%
NO	17	85.0%
YES	3	15.0%
CAPSULAR CONTRACTURE	3	15.0%
IMPLANT EXTRUSION	1	5.0%
RECURRENCE	0	0.0%

As shown in Table 6, was 3 patients (15%) had late complications in the form of: 3 patients (15.0%) were capsular contracture and one patient (5%) were implant extrusion.

#### 4. Discussion

According to historical reports, subpectoral implants have shown significantly better results than subcutaneous ones.<sup>10</sup>

Compared to previously published case series, our complication rates are significantly lower. With implants positioned subcutaneously, the prior case series showed a more than 20% cumulative contracture rate.<sup>11</sup>

Recent studies by Bernini et al.<sup>12</sup> comparing subcutaneous versus subpectoral implant placement revealed zero grade III-IV contractures and a markedly better result in contractures and aesthetics. The implants were placed subcutaneously using either ADM or titanium-coated mesh. They postulated that, as opposed to subpectoral insertion, subcutaneous placement prevents any mechanical stress over the implant and its capsule.

Furthermore, there is strong evidence from cosmetic breast augmentation that capsular contracture is less joint when textured implants are used in a sub-glandular position as opposed to smooth implants.<sup>13</sup>

According to the senior surgeons in this paper, subcutaneous placement is more accurate and less complicated in terms of technique when it comes to forecasting symmetry and size, particularly in ptotic breasts. For the SSM, a vertical inframammary incision was made. Whenever feasible, at least 5 millimetres of subcutaneous fat were preserved with the skin envelope to prevent subcutaneous implants from endangering the blood supply of the surrounding skin. The senior author's assessment, influenced mainly by the intraoperative viability of the mastectomy skin flaps, was used to determine whether to put implants subcutaneously or subpectorally.

Most issues were modest and far fewer than those reported in published works. With a frequency of 47% in implants inserted subcutaneously, malrotation of the implant is a

known complication in the literature.<sup>14</sup>

The seroma and hematoma rates we reported aligned with published data. Oral antibiotics and percutaneous drainage were used to treat hematomas and seromas with no long-term effects. 19.2% (n = 5) of the patients needed further fat injections to correct contour errors, which resulted in upper pole hollowing.<sup>15</sup>

Our fat grafting rates exceeded the 9-12% reported in prior publications. The fact that we did not always utilize mesh could help to explain this, as it could conceivably accentuate contour flaws. However, no problems arose after the day-long procedures used to manage all fat grafting cases.<sup>16</sup>

Our patient sample had no predicted variables for further postoperative problems. This stands in contrast to current research that indicates older populations and smokers have more excellent rates of problems.<sup>17</sup>

A vertical infraareolar incision has been used to implant implants in certain patients, which has several benefits. There is good access and a comparable operative view to other incision patterns from the perspective of the mastectomy. Being parallel to the blood vessels, a vertical incision should protect both the inferiorly based random blood supply and the superiorly based-axial blood supply. Literature that directly assesses blood flow and incision type is scarce.

According to one study, patients enduring a submammary incision as opposed to a "lazy-S" horizontal-shaped lateral incision had a 36% decrease in the superficial circulation as assessed by fluorescein flowmetry 2 cm below the nipple-areolar complex.<sup>18</sup>

#### 4. Conclusion

Skin-sparing mastectomy with immediate implant reconstruction is safe and gives good aesthetic outcomes. Finding suitable patients and skin flap viability is essential to utilize this strategy and get the best results.

In our limited number of cases, there is a promising result, but to support this study, a larger number of cases and longer durations of follow-up are needed.

#### Disclosure

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

#### Authorship

All authors have a substantial contribution to the article

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## Conflicts of interest

There are no conflicts of interest.

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