

Intraglandular flap as an oncoplastic technique for the treatment of breast cancer located in the upper outer quadrant



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SUMMARY

Background and aim: Breast conserving therapy is the gold standard treatment of early breast cancer. However, a balance between good cosmetic outcome and limiting the risk of local recurrence remains the key to success. The intraglandular flap is a volume displacement technique in which the glandular tissue is being used to close the tissue defect. The aim of this study was to assess safety and cosmetic result of the intraglandular flap in the treatment of breast cancer located in the upper outer quadrant.

Methods: The present study was conducted on 44 female patients who had subjected to intraglandular flap as an oncoplastic technique through tennis racquet incision for treatment of early or locally advanced breast cancer that down staged by neoadjuvant chemotherapy located in the upper outer quadrant at the Surgical Oncology Unit, General Surgery Department, Tanta University Hospital during the period from October 2017 to May 2018. The safety, feasibility of the procedure, complications, cosmetic outcome and patients' satisfaction were evaluated.

Results: The age of the patients ranged from 38 to 65 years with a mean age of 49.7 years. The operative time ranged between 90 to 130 minutes with a mean of 105 minutes. 9 patients (20.5%) developed postoperative seroma, 8 patients (18%) had wound infection and two patients (4.5%) had a stitch abscess with no local recurrence or distant metastasis. As regard the cosmetic outcome; 22 patients (50%) considered it excellent, 16 patients (36.4%) considered it good and 6 patients (13.6%) considered it fair. As regard the degree of satisfaction, 34 patients (77.3%) rated a good satisfaction and 10 patients (22.7%) had a fair satisfaction.

Conclusion: The intraglandular flap is an easy and safe technique with good cosmetic results, good patient satisfaction with minimal complications.

KEYWORDS

Breast cancer, Oncoplastic breast surgery, Intraglandular flap, Cosmeses

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1. INTRODUCTION

Breast conserving therapy is the gold standard treatment of early breast cancer. However, a balance between good cosmetic outcome and limiting the risk of local recurrence remains the key to success. So when excising breast cancer, the surgeon faces two opposing goals: clear margins versus an acceptable cosmetic result [1].

Oncoplastic breast conservation surgery (OBCS) is combining the principles of cancer resection to achieve wide tumor free margins with the best principles of reconstruction to optimize cosmetic outcomes and minimize complications, but it is much more than a combination of two disciplines. It is a philosophy that requires vision, passion, knowledge of anatomy and an appreciation and understanding of aesthetics, symmetry

and breast function [2, 3].

Reconstruction of the breast tissue can be done with either the volume displacement technique that uses the remaining breast tissue or the volume replacement technique that uses other autologous tissue to supplement the insufficient breast tissue [4].

Moreover, oncoplastic techniques allow wide breast resection, wider than that performed with conventional breast conservation surgery (BCS) making it possible to expand the indications of BCS to include those patients who have an nipple areola complex (NAC) response unsuitable for conventional BCS [5–7].

The selection of the oncoplastic surgical technique that will yield a cosmetically appealing result is done by determining the patient's breast size and lesion location prior to surgery [4, 8, 9]. The aim of this study was to assess safety, feasibility, complications and cosmetic result of the intraglandular flap as an oncoplastic technique in the treatment of early breast cancer or locally advanced breast cancer that down staged by neoadjuvant chemotherapy located in the upper outer quadrant.

2. PATIENTS AND METHODS

The present study was conducted on 44 female patients presented with breast cancer in the upper outer quadrant at the Surgical Oncology Unit, General Surgery Department, Tanta University Hospital during the period from October 2017 to May 2018. The patients included in the study had an early breast cancer (stage I or II) located in upper outer quadrant or

locally advanced breast cancer who received neoadjuvant chemotherapy that makes them eligible for BCS with the following characters:

- complete resolution of skin edema;
- residual tumor size of less than 4 cm;
- no evidence of multicentric disease or diffuse microcalcification.

The patients in whom a negative margin cannot be achieved, multicentric disease, diffuse mammographic micro-

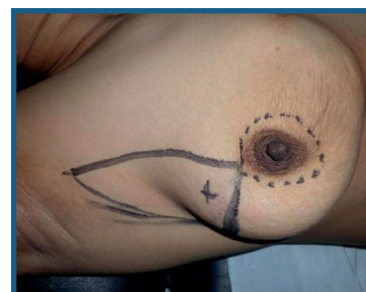


Figure 1.
Preoperative marking.



Figure 2.
Skin incision over the marked line.

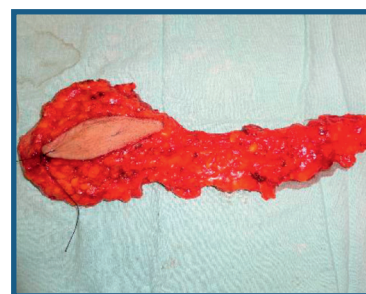


Figure 3.
The excised specimen with the axillary lymph nodes.

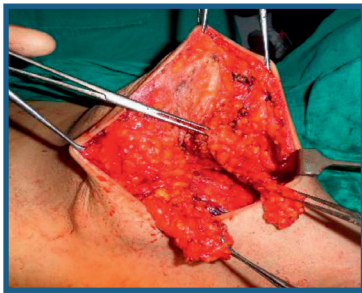


Figure 4.
A mobilized glandular flaps.

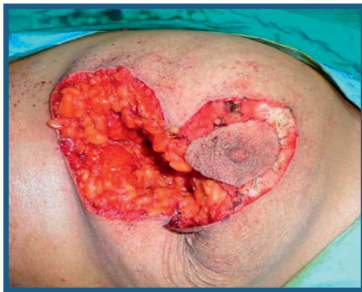


Figure 5.
Opposition of the glandular flaps with de-epithelialization of the crescent shaped skin around NAC.



Figure 6.
Skin closure over a suction drain.

calcification, inflammatory carcinoma, previous breast radiotherapy, scleroderma, pregnant women and large tumor in small breast were excluded from the study.

Every patient had subjected to history taking, general and local breast examination and investigations that include:

- complete blood picture;
- liver function tests;
- renal function tests;
- fasting and postprandial blood sugar;
- prothrombin time and activity and blood grouping;
- bilateral X-ray mammography & complimentary breast ultrasound;
- Fine needle aspiration cytology (FNAC) and/or Tru-cut biopsy;
- Chest X- ray rv CT scan;
- abdominal ultrasound or CT scan and bone scan when indicated.

A single dose of prophylactic antibiotic (Augmentine 1.2gm IV) was given 1 hour before the operation with preoperative marking and photography while the patient in the upright position. The procedure had performed under general anesthesia. The patient was positioned in a supine position and the arm of the operative side was abducted at right angle on an arm board (**Figure 1**).

Operative technique

Incision of the skin over the marked line (Tennis racquet incision) was done. A fusiform excision including subcutaneous tissue till the pectoral fascia was made with the tumor in the center with Level I and II axillary dissection (**Figure 2, 3**).

Subsequently breast tissue was mobilized from the pectoralis muscle to the borders of the skin flaps. Mobilized glandular flaps were opposed side by side and sutured to each other and to the underlying fascia. The crescent-shaped skin around the nipple areola complex (NAC) was deepithelialized in the area opposi-

te to the skin incision. NAC was sutured to the de-epithelialized area to be settled in the center of the reshaped breast. The wideness of de-epithelialization was adjusted proportional to the length of incision. Intraoperative frozen section was used to confirm a free surgical margin. The skin was closed with a subcuticular sutures over a closed suction drain. The excised specimen containing the tumor was oriented, formalin-fixed and sent for histopathology, Estrogen Receptors (ER), Progesteron Receptors (PR) and Her-2-neu overexpresion (**Figure 4-6**).

Follow-up

The drain evacuated daily and removed when the amount collected per 24 hour ≤ 50 cc or for maximum duration 14 days. The first dressing was done on the 3rd post-operative day for detection of hematomas, wound dehiscence, wound infection or seroma (both clinically and by ultrasound). The patients discharged on the third or fourth postoperative day. A follow up mammography and breast ultrasound had performed after 3 and 6 months for detection of any local recurrence. The overall cosmetic outcome was evaluated after 6 months using Harvard scale introduced by Jay Harris in 1979 [10]. It classifies cosmetic results in four classes: excellent, good, fair and poor.

The patients asked to rate their degree of satisfaction about the parameters showed in table 1 and a 4 point score of 1 (very dissatisfied), 2 (somewhat dissatisfied), 3 (somewhat satisfied) and 4 (very satisfied) was used for evaluating each parameter.

Patient satisfaction can be graded into 3 grades according to overall score with good satisfaction ranging from 20-24, fair satisfaction ranging from 15-19 and poor satisfaction from 10-14. This was inspired by calabrese scale [11] who used a scoring system that ranged from 1 to 3 (best result) that evaluate the shape, volume and symmetry of the operated on

Parameter	Score			
	1	2	3	4
Satisfaction with shape	very dissatisfied	somewhat dissatisfied	somewhat satisfied	very satisfied
Satisfaction with size				
Satisfaction with symmetry				
Satisfaction with nipple position				
Satisfaction with scar appearance				
Cutaneous effects from radiotherapy				

Table 1.
Patient satisfaction scale

breast. Excellent 8-9, good 6-7, fair 4-5, poor 3 or less (**Table 1**).

Informed consent was obtained from all patients participating in the study. The study was approved by Tanta Faculty of Medicine ethical committee. Statistical analysis was conducted using SPSS V.20 and P value ≤ 0.05 was considered significant.

3. RESULTS

The age of the patients ranged from 38 to 65 years with a mean age of 49.77 ± 7.78 years. 10 patients (22.7%) had DM, 10 patients (22.7%) had hypertension and 2 patients (4.6%) had ischemic heart disease (**Table 2**).

In the present study; 25 patients (56.8%) presented with left side breast cancer and 19 patients (43.2%) presented with right side breast cancer. Our study included 16 patients (36.3%) with early breast cancer and 28 patients (63.7%) with locally advanced breast cancer who received neoadjuvant chemotherapy for down staging of the tumor that made them eligible for OCBS.

Evaluation of pre and post chemotherapy tumor size was done for the 28 pa-

tients who received neo-adjuvant chemotherapy. Mean tumor size prior to chemotherapy was 3.19 ± 1.16 cm (range from 1.9 to 6 cm). However, mean tumor size after neo-adjuvant therapy was 1.96 ± 0.26 cm (range from 1.5 cm to 2.5 cm) with significant P value (0.001).

Intraoperative frozen section was done for all patients and free margins were assured in all cases that confirmed by histopathological examination. The operative time ranged from 90 to 130 minutes with a mean time of 105 minutes. The length of incision (cm) ranged from 7 to 11 cm with a mean length of 8.7 cm.

Age (years)	No.	%
≤ 45	16	36.4
45-50	12	27.3
>50	16	36.4
Min.-Max.	38.0-65.0	
Mean \pm SD.	49.77 ± 7.78	
Median	50.0	

Table 2.
Distribution of the studied cases according to the age.

Histopathology	No.	%
IDC, GII	30	68.5
IDC, GIII	8	18
Mixed lobular and ductal carcinoma	2	4.5
Insitu ductal carcinoma	2	4.5
ILC GII	2	4.5

Table 3.
Histopathological finding.

As regard the histopathological types of the resected specimen, invasive duct carcinoma (IDC) was the commonest histological finding in 86.5% of the patients (Table 3)

Follow-up

Six patients (13.6%) developed postoperative seroma, 4 patients (9%) had wound infection. As regard the cosmetic outcome; 22 patients (50%) considered it excellent, 16 patients (36.4%) considered it good and 6 patients (13.6%) considered it fair. As regard the degree of satisfaction, 34 (77.3%)

Table 4.
Cosmetic outcome & patient satisfaction.

	No.	%
Cosmetic results (N=44)		
Excellent	22	50
Good	16	36.4
Fair	6	13.6
Poor	0	0
Patient satisfaction (N=44)		
Good	34	77.3
Fair	10	22.7
Poor	0	0

patients rated good satisfaction and 10 patients (22.7%) rated fair satisfaction. It was found that; the cosmetic outcome was inversely proportional to the tumor size; where excellent outcome had associated with mean tumor size of 1.63 cm, good with a mean tumor size of 1.98 cm and fair with a mean size of 2 cm but these result was statistically insignificant. No local recurrence or distant metastasis was detected with no mortality (Table 4 & figure 7).



Figure 7.
Postoperative photo after 6 months.

4. DISCUSSION

Breast-conservation therapy with lumpectomy is a valuable component of breast cancer treatment, with an equivalent survival outcome to that of mastectomy. In addition to physical preservation, women who undergo breast conservation have a better view of their body image, lifestyle scores and might have less adverse physical sequelae from asymmetry, chest wall adhesions, and numbness associated with mastectomy [12- 15].

The goals of locoregional treatment of breast cancer are the removal of the tumor with safe surgical margins, the preservation of the natural contour of the breast, and the correction of breast asymmetry. In current practice, the patients with small (T1 and T2) tumors are candidates for BCS. But, the traditional breast-conserving techniques might be inadequate

to meet these goals. Oncoplastic surgery (OPS), when compared with traditional BCS techniques, warrants similar oncological results (surgical margins, local recurrence) with better cosmetic outcome. The basic point to get good cosmetic results without requiring reduction mammoplasty to the contralateral breast is to expand breast parenchyma to the area of tissue defect. The intraglandular flap is a volume displacement technique in which the glandular tissue is being used to close the tissue defect [5, 16].

In the presented study, the age of the patients ranged from 38 to 65 years with a median age of 49.7 years, that was close to the results of the study done by Lutfi Dogan et al [17] which was conducted on 47 female patients with a mean age of 48.5 years with a range from 24 to 63 years. In comparison with another study done by Sue K Down et al [18] that performed on 37 female patients with age ranged from 35 to 86 years with a mean age of 52 years old.

In the current study, 25 patients (56.8%) presented with left side breast cancer and 19 patients (43.2%) presented with right side breast cancer which was close to the study of Rafal Matkowski et al [19] who found left breast cancer in 54% and right breast cancer in 46% of the cases. The pre-chemotherapy tumor size ranged from 1.9 to 6 cm with a mean size of 3.19 ± 1.16 cm. This coincides with the study of Lutfi Dogan et al [17] that showed a mean tumor size of 3.53 ± 0.8 cm.

In our study, Intraoperative frozen section was done for all patients and free margins were assured in all cases. This is consistent with study performed by Lutfi Dogan and et al [17] and Sue K Down et al [18] in which one patient necessitating mastectomy for surgical resection margin positivity. The operative time in this study ranged from 90 to 130 minutes with a mean of 105 minutes. which longer than the operative time of the study Rafal Matkowski et al [19] who found a mean operative time of 62.7 ± 14.4 ran-

ging from 40 min to 90 min.

As regard the histopathological types of the resected tumor, invasive duct carcinoma was the commonest finding in 86.5% of the patients. This comparable with results of Sue K Down et al [18] and Rafal Matkowski et al [19] who found that invasive duct carcinoma was the commonest finding in 89.2% and 80% respectively.

In the present study, six patients (13.6%) developed postoperative seroma, 4 patients (9%) had wound infection with no local recurrence or distant metastasis. In comparison with the study of Jung Dug Yang et al [20], wound infection developed in two patients. Yuko Kijima et al [21] stated that; there is no local recurrence or distant metastasis was seen in any case.

In our study, as regard the cosmetic outcome, 22 patients (50%) considered it excellent, 16 patients (36.4%) considered it good and 6 patients (13.6%) considered it fair. As regard the degree of satisfaction; 34 patients (77.3%) rated good satisfaction and 10 patients (22.7%) rated fair satisfaction. In comparison to Yuko Kijima et al [21] the score was excellent in one patient and good in the majority of patients. Also Fitoussi et al [22] reported in their study that the cosmetic result of patient satisfaction rate was 98%. Similarly Malka et al [23] reported postoperative good and/or excellent results of 84-89% of the intraglandular flap technique. Also Yang et al [24] in their study have shown a higher satisfaction rate with aesthetic result when using this type of oncoplastic techniques.

5. CONCLUSION

The intraglandular flap is an easy and safe technique with adequate surgical margins, good cosmetic results and good patient satisfaction with minimal complications. It is an excellent immediate reconstructive option after breast conservative surgery.

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