A prospective comparative study of locoregional recurrence rate after oncoplastic breast surgery versus wide local excision of breast carcinoma

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Background
Breast cancer is the commonest cancer in Egypt in women. There are about 39% of total malignancies in Egyptian females and it is a leading cause of mortality among them.
Objective
The aim of this study was to compare locoregional recurrence rate after oncoplastic breast surgery versus wide local excision of breast carcinoma.
Patients and methods
This prospective study was conducted at Ain Shams University Hospitals on 50 patients, –25 of them underwent oncoplastic breast surgery and –25 underwent wide local excision, as a part of the treatment of breast cancer, to compare the rate of a breast cancer recurrence over 1.6 years starting from December 2018. Approval of the Ethical Committee and written informed consent from all participants were obtained.
Results
Our study included 50 patients, 25 of them underwent wide local excision for stages 1 and 2 breast cancer, the other 25 underwent oncoplastic breast surgery for stages 1 and 2 breast cancer. Our mean age was 44.24±8.13 years (28–60 years). In total, nine (18.0%) had a positive family history of mammary cancer, five (10.0%) patients were diabetic, three (6.0%) patients were hypertensive, the mean size of the tumor was 3.54±1.16 (1–5) cm. Grades of the tumor were grade 1 32 (64.0%), grade 2 11 (22.0%), and grade 3 7 (14.0%); sentinel lymph node biopsy was done in six (12.0%) of patients; there is a high correlation between the closest free margin and the technique of surgery used where 96% of cases undergoing oncoplastic breast conservation surgery had the closest free margin more than 2 cm in comparison to 24% of cases undergoing wide local excision. Regarding recurrence rate, although there are two cases of locoregional recurrence that occurred after wide local excision versus no recurrence in the oncoplastic breast conservation surgery group, this has been of no statistical significance. There is a significant relation between diabetes mellitus and cosmetic outcome, where 20% of diabetic patients have poor cosmetic outcome and 90% of patients with the excellent cosmetic outcome have no comorbidities.
Conclusion
On short-term follow-up done in our study of 1.5 years, there is no significant difference in the recurrence rate of stages 1 and 2 breast cancer after wide local excision and oncoplastic breast surgery, but there has been a significant increase in the size of the closest free margin in oncoplastic breast surgery compared with wide local excision.

Keywords:
breast cancer recurrence, oncoplastic breast surgery recurrence, wide local excision of breast cancer

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Introduction

The oncological safety of oncoplastic breast conservation surgery (OBCS) compared with wide local excision (WLE) is debated owing to the lack of high-level evidence, and prospective randomized trials are unlikely to be ever undertaken, given the complex ethical considerations [1].

There has been considerable controversy regarding the optimal negative margin width for minimizing local recurrence (LR) in patients undergoing

breast-conserving therapy for both invasive and intraductal carcinoma. Approximately 25% of patients with invasive carcinoma and one-third of those with DCIS undergo re-excision, with approximately half of the re-excision performed in patients with negative margins (defined as no ink on tumor), apparently in the belief that a larger negative margin improves patient outcomes [2].

Houssami and colleagues performed a study-level meta-analysis that included 33 eligible studies and more than 28 000 women with early-stage breast cancer. A positive margin was associated with increasing LR (odds ratio for positive margins vs. negative margins, 2.44; 95% confidence interval, 1.97–3.03; $P<0.001$), even after it had been controlled for the use of a radiation boost or adjuvant endocrine therapy. Importantly, there was no evidence of a decreased LR risk with negative margin widths increasing from (1–2) mm to 5 mm. These data confirm that even with modern multimodality treatment, a negative margin reduces the risk of LR; however, increasing the size of a negative margin is not significantly associated with an improvement in local control [3].

In 2014, the Society of Surgical Oncology (SSO) and the American Society for Radiation Oncology (ASTRO) convened a multidisciplinary panel to develop a consensus guideline on the appropriate margin width to minimize the risk of LR. Using data from the meta-analysis of Houssami and colleagues as well as other published literature, a negative margin of no ink on the tumor optimizes local control and that the routine practice of obtaining a more widely negative margin than no ink on tumor is not indicated [4].

Many articles recommended LR rates of OBCS to be compared with simple WLE, since breast conservation surgeries are carried out in both groups with various surgical techniques [5].

Aim

The aim of this study was to compare locoregional recurrence rate after oncoplastic breast surgery versus wide local excision of breast carcinoma.

Patients and methods

This study is a prospective study that was conducted at Ain Shams University hospitals collecting records of 50 patients, –25 of them underwent oncoplastic breast surgery and –25 underwent wide local excision, as a part of the treatment of breast cancer, to compare the rate of a breast cancer recurrence over one-and-a-half years.

Methods

Details of patients treated with OBCS and WLE were recorded prospectively into a standardized database.

Each group of patients is consecutive. Clinical records of the patients were analyzed for demographic, tumor, and treatment characteristics.

The oncoplastic technique was determined by patient's anatomy, preferences, and tumor location, which resulted in a variety of methods applied.

Patients who underwent significant volume excision followed by volume-displacement technique accompanied by adequate skin envelope reduction, or true volume-replacement technique, were included in the OBCS study group.

Simple reshaping, such as dual-plane mobilization without skin reduction, was listed under WLE, since this technique is routinely performed for smaller lesions in order to prevent deformity.

Level 1–2 axillary dissection was carried out for patients with metastatic sentinel lymph nodes proven at a frozen section and for patients with unidentified sentinel lymph nodes and clinically axillary positive lymph nodes.

Selection criteria for cases

Inclusion criteria

(1) For group A (OBCS):
   (a) Adult female patients of age (18–60) years.
   (b) Cases that underwent oncoplastic surgery as a treatment for breast cancer stage (I–II).
   (c) Cases that underwent significant volume excision followed by volume-displacement technique accompanied by adequate skin envelope reduction, or true volume-replacement technique.
   (d) Cases not at high risk of postoperative infection and fit for lengthened surgeries.
   (e) Cases with large-tumor breast-size ratio.
(2) For group B (WLE)
   (a) Adult female patients of age (18–60) years.
   (b) Cases that underwent wide local excision surgery as a treatment for breast cancer stage (I–II).

(c) Cases undergoing simple reshaping, such as dual-plane mobilization without skin reduction, were included in this group.
(d) Cases with comorbidities with increased risk of infection or not fit for lengthened surgeries.
(e) Cases with small-tumor breast-size ratio.

Exclusion criteria

(1) Patients with previous malignancy not related to breast.
(2) Patients undergoing previous ipsilateral or contralateral breast surgery.
(3) Multicentric and multifocal breast cancer.
(4) As for patients presenting with bilateral breast cancers, the cancer side carrying the worse prognosis was in the analysis only.
(5) Cases not fulfilling the follow-up period.

All patients were subjected to the following:

Preoperative workup:

(1) Informed consent.
(2) Full clinical history, present history, and past history.
(3) Full clinical examination: BMI, vital signs, and body examination.
(4) Routine preoperative investigations, including complete blood count, random blood sugar, liver function test, kidney function test, coagulation profile, lipid and thyroid profile, and serum electrolytes.
(5) Electrocardiography.

Study tools

Data collected are variables included in diagnostic modality, biopsy type (core/open), all surgeries associated with a breast cancer diagnosis (BCS, wide local excision, axillary surgery, and reconstruction), and primary tumor characteristics (tumor size [0–<2 cm, 2–<5 cm]).

Primary histologic type (ductal, lobular, mixed, and other), grades (I, II, or III), and postoperative pathology. The presence of lymphovascular invasion (LVI) (yes/no), total number of nodes positive (0, 1–3, 4).

Presence of extranodal deposits (yes/no).

Estrogen receptor status (ER) (negative/positive), progesterone receptor status PR (negative/positive), human epidermal growth factor receptor HER 2 status when available (negative/positive), and size of the closest margin (0 mm, >0–2 mm, and >2 mm).

Radiation therapy [(yes/no)], chemotherapy (yes/no) (adjuvant or neoadjuvant).

Also, besides, it was determined if there was a recurrence of the tumor in 1.5 years postdefinitive surgery.

Tools of diagnosis of recurrence

(1) Follow-up visits at the breast clinic are scheduled after 1 week for follow-up of pathology report and wound healing by clinical examination.

Then follow-up visits every 3 months in the first year postoperative, then one visit after 6 months as follows:

(1) Diagnosis of recurrence was evaluated by clinical examination every 3 months.
(2) Routine mammogram+ultrasound breast on visits every 6 months postoperative.
(3) Suspected cases of recurrence are further evaluated by tumor markers, magnetic resonance irradiation, and Tru-cut biopsy.

Results

Preoperative findings

Our study included 50 patients, 25 of them underwent wide local excision for stages 1 and 2 breast cancer, the other 25 underwent oncoplastic breast surgery for stages 1 and 2 breast cancer. Our mean age was 44.24±8.13 years (28–60 years). In total, nine (18.0%) had positive family history of mammary cancer, five (10.0%) patients were diabetic, three (6.0%) patients were hypertensive, the mean of size of the tumor was 3.54±1.16 (1–5) cm, grades of the tumor were grade 1 32 (64.0%), grade 2 11 (22.0%), and grade 3 7 (14.0%), and sentinel lymph node biopsy was done in six (12.0%) of patients as shown in Table 1, Figs 1 and 2.

There is a significant correlation between the size of the tumor and the method of breast surgery used, the mean size of tumors in the OBCS group is 4 cm, while in the WLE group, it is 3.08 cm, this is shown in Table 2, Fig. 3.

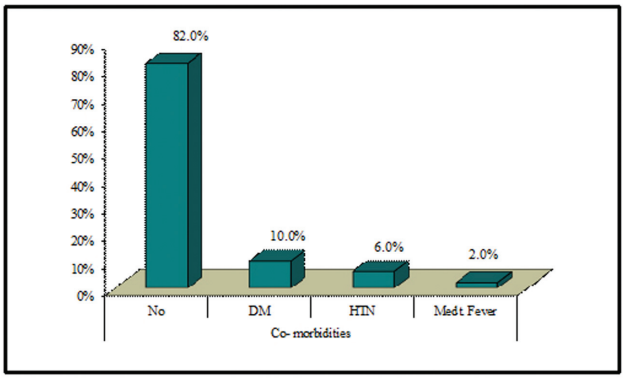
There is a high correlation between the closest free margin and the technique of surgery used where 96% of

Table 1 Patient and tumor characteristics

	N=50 [*n* (%)]
Age	
Mean±SD	44.24±8.13
Range	28–60
FH	
No	41 (82.0)
Yes	9 (18.0)
Comorbidities	
No	41 (82.0)
DM	5 (10.0)
HTN	3 (6.0)
Medt. fever	1 (2.0)
Size of the tumor in cm	
Mean±SD	3.54±1.16
Range	1–5
Grade of the tumor	
Grade 1	32 (64.0)
Grade 2	11 (22.0)
Grade 3	7 (14.0)
Sentinel lymph nodes	
No	44 (88.0)
Yes	6 (12.0)

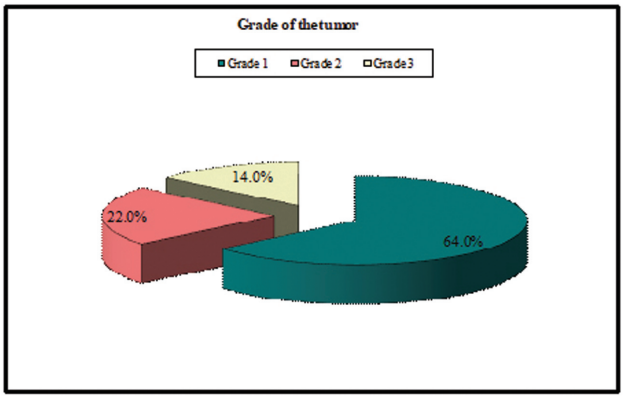
DM, diabetes mellitus; FH, family history; HTN, hypertension.

Figure 1



Percentage of patients with different comorbidities.

Figure 2

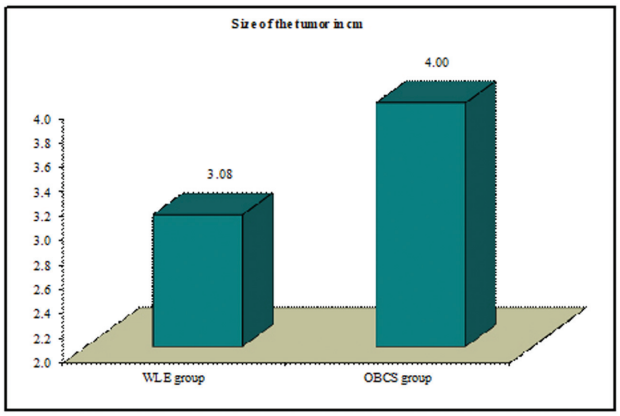


Grades of the tumors.

Table 2 Tumor characteristics, chemotherapy, and radiotherapy given

	n (%)
Number of nodes	
No	14 (28.0)
1 : 3	9 (18.0)
>3	27 (54.0)
Estrogen receptor status	
Negative	12 (24.0)
Positive	38 (76.0)
Progesterone receptor status	
Negative	23 (46.0)
Positive	27 (54.0)
Her2	
Negative	45 (90.0)
Positive	5 (10.0)
Size of the closest margin	
0 ml	8 (16.0)
0 2 cm	12 (24.0)
>2 cm	30 (60.0)
Radiation therapy	
No	50 (100.0)
Yes	0
Neoadjuvant chemotherapy	
No	46 (92.0)
Yes	4 (8.0)
Chemotherapy	
Adjuvant	
No	0
Yes	50 (100.0)
Hormonal	
No	15 (30.0)
Yes	35 (70.0)

Figure 3



Sizes of the tumors estimated preoperatively.

cases undergoing OBCS had the closest free margin of more than 2 mm in comparison to 24% of cases undergoing WLE as shown in Table 3, Fig. 4.

Regarding recurrence rate, although there are two cases of locoregional recurrence that occurred after WLE

versus no recurrence in the OBCS group, this has been of no statistical significance, this is shown in Table 4.

Regarding seroma formation, wound dehiscence, hematoma, postoperative infection, and nipple/flap necrosis, there is no significant difference between the two groups.

As for lymphedema of the arm, it was significantly higher in OBCS group four cases (16%) versus WLE group (0%) of the cases, as shown in Fig. 5.

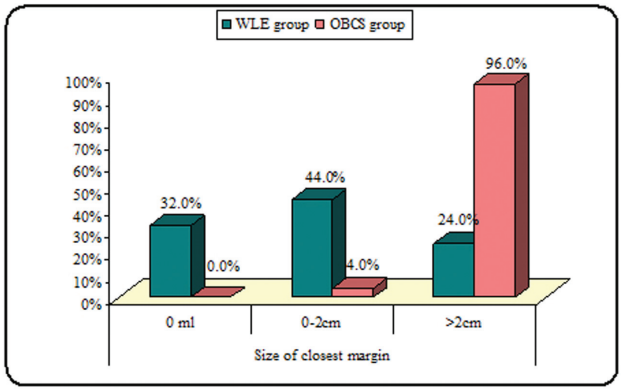
WLE group

The grade of the tumor does not have a significant relation to the recurrence rate.

In our study age, positive family history, comorbidities, size, and grade of the tumor had no statistical significance in relation to short-term locoregional recurrence, as shown in Table 5.

The two cases of recurrence had positive nodes of more than 3 at the time of surgery, but this was not statistically significant. The two cases of LR had the size of the closest margin less than 2 cm. ER status was highly significant with locoregional recurrence being positive in 78.3 of nonrecurrent cases and negative in 100% of recurrent cases, 2/5 of ER-negative patients had locoregional recurrence. Both of the two cases were PR- and Her 2-negative, this is shown in Fig. 6, Table 6.

Figure 4



Size of the closest margin in both groups.

Table 3 Characteristics of the tumor, chemotherapy, and radiotherapy given in both groups

	WLE group [*n* (%)]	OBCS group [*n* (%)]	Test value*	*P* value	Significance
Number of nodes					
No	7 (28.0)	7 (28.0)			
1 : 3	6 (24.0)	3 (12.0)	1.333	0.513	NS
>3	12 (48.0)	15 (60.0)			
Estrogen receptor status					
Negative	7 (28.0)	5 (20.0)	0.439	0.508	NS
Positive	18 (72.0)	20 (80.0)			
Progesterone receptor status					
Negative	12 (48.0)	11 (44.0)	0.081	0.777	NS
Positive	13 (52.0)	14 (56.0)			
Her2					
Negative	22 (88.0)	23 (92.0)	0.222	0.637	NS
Positive	3 (12.0)	2 (8.0)			
Size of the closest margin					
0 ml	8 (32.0)	0 ((0.0)			
0–2 mm	11 (44.0)	1 (4.0)	27.133	0.000	HS
>2 mm	6 (24.0)	24 (96.0)			
Radiation therapy					
No	25 (100.0)	25 (100.0)	NA	NA	NA
Yes	0	0			
Neoadjuvant chemotherapy					
No	23 (92.0)	23 (92.0)	0.000	1.000	NS
Yes	2 (8.0)	2 (8.0)			
Adjuvant					
No	0	0	NA	NA	NA
Yes	25 (100.0)	25 (100.0)			
Hormonal					
No	8 (32.0)	7 (28.0)	0.095	0.758	NS
Yes	17 (68.0)	18 (72.0)			

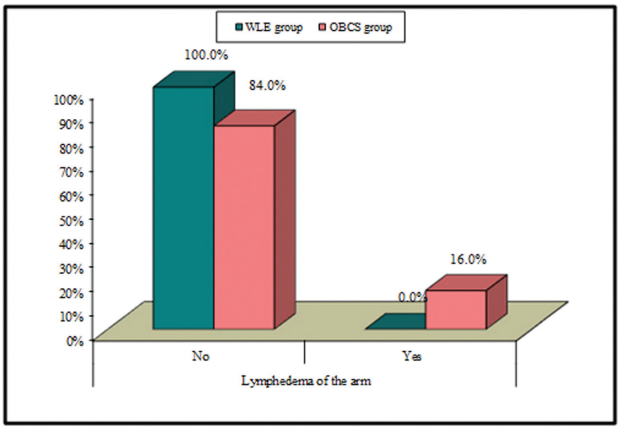
HS, highly significant; OBCS, oncoplastic breast conservation surgery; WLE, wide local excision. $P>0.05$. $P<0.05$. $P<0.01$.

Table 4 Postoperative results in both groups

	WLE group [*n* (%)]	OBCS group [*n* (%)]	Test value*	*P* value	Significance
Recurrence					
No	23 (92.0)	25 (100.0)			
Local	2 (8.0)	0	2.083	0.149	NS
Regiona	0	0			
Distant	0	0			
Side of the tumor					
Left	13 (52.0)	12 (48.0)	0.080	0.777	NS
Right	12 (48.0)	13 (52.0)			
Site of the tumor					
UOQ	12 (48.0)	10 (40.0)			
LIQ	10 (40.0)	9 (36.0)	3.234	0.357	NS
UIQ	1 (4.0)	5 (20.0)			
LOQ	2 (8.0)	1 (4.0)			
Biopsy					
Tru-cut	24 (96.0)	23 (92.0)	0.355	0.552	NS
FNAC	1 (4.0)	2 (8.0)			
Histopathological results					
IDC	23 (92.0)	22 (88.0)	0.222	0.637	NS
Mammary carcinoma	2 (8.0)	3 (12.0)			
Seroma formation					
No	22 (88.0)	23 (92.0)	0.222	0.637	NS
Yes	3 (12.0)	2 (8.0)			
Development of hematoma and infection					
No	23 (92.0)	23 (92.0)			
Hematoma	1 (4.0)	2 (8.0)	1.333	0.513	NS
Wound infection	1 (4.0)	0			
Lymphedema of the arm					
No	25 (100.0)	21 (84.0)	4.348	0.037	S
Yes	0	4 (16.0)			
Wound dehisence					
No	24 (96.0)	24 (96.0)	0.000	1.000	NS
Yes	1 (4.0)	1 (4.0)			
Partial nipple/flap necrosis					
No	24 (96.0)	25 (100.0)	1.020	0.312	NS
Yes	1 (4.0)	0			

HS, highly significant; IDC, intraductal carcinoma; OBCS, oncoplastic breast conservation surgery; WLE, wide local excision. $P>0.05$. $P<0.05$. $P<0.01$.

Figure 5



Postoperative lymphedema in both groups.

Regarding histopathological results, there was a significant relation between mammary carcinoma 1 of two cases: a recurrence of 50%, while intraductal carcinoma (IDC) has recurrence of one case of 23 cases, 4.3% of the WLE group, as shown in Table 7, Fig. 7.

In our study, there is a significant relation between diabetes mellitus and cosmetic outcome, where 20% of diabetic patients have a poor cosmetic outcome. In total, 90% of patients with the excellent cosmetic outcome have no comorbidities, this is shown in Table 8, Fig. 8.

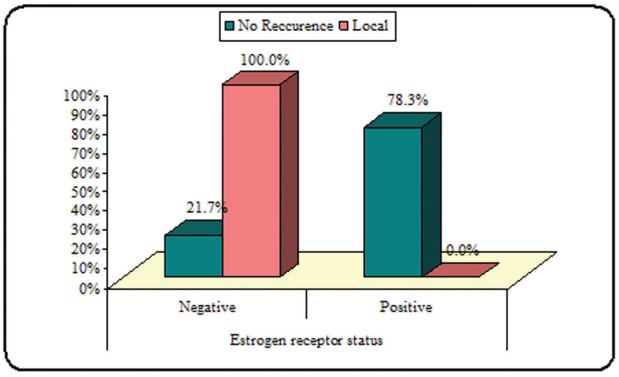
There is a significant correlation between development of hematoma, infection, and the

Table 5 Relation between demographic data of the patients and locoregional recurrence

	Recurrence [*n* (%)]				
	No *N*=23	Local *N*=2	Test value	*P* value	Significance
Age					
Mean±SD	42.57±7.02	44.00±12.73	−0.264•	0.794	NS
Range	30–58	35–53			
FH					
No	20 (87.0)	1 (50.0)	1.870*	0.171	NS
Yes	3 (13.0)	1 (50.0)			
Size of the tumor in cm					
Mean±SD	3.09±1.16	3.00±0.00	0.104•	0.918	NS
Range	1–5	3–3			
Grade of the tumor					
Grade 1	14 (60.9)	0			
Grade 2	4 (17.4)	1 (50.0)	2.808*	0.246	NS
Grade 3	5 (21.7)	1 (50.0)			
Sentinel lymph nodes					
No	19 (82.6)	2 (100.0)	0.414*	0.520	NS
Yes	4 (17.4)	0			

FH, family history. $P>0.05$. $P<0.05$. $P<0.01$. *χ^2test. •Independent *t*-test.

Figure 6



Estrogen receptor status in recurrent and nonrecurrent cases.

cosmetic outcome, where 50% of patients had poor cosmetic outcome and postoperative wound infection, this is shown in Table 9, Fig. 9, an example of cosmetic results after wide local excision is shown in Fig. 10.

OBCS group

Table 10 Comorbidities in this group could not reflect the impact of diabetes as in WLE, that is because no diabetic patients are in this group. This is shown in Fig. 10.

Development of hematoma is highly related to bad cosmetic outcome in our study, this is shown in Table 11. An example of round-block technique and superior-pedicle technique is shown in Figure 11, respectively.

Discussion

Breast cancer has threatened human health for a long time, and many trials have been carried out to discover the mechanism of its occurrence and treatment [6].

Oncoplasty has recently succeeded to achieve the difficult equation of patient recovery and optimal cosmetic outcome without jeopardizing oncological safety [7].

Our study included 50 patients, 25 of them underwent wide local excision for stages 1 and 2 breast cancer, the other 25 underwent oncoplastic breast surgery for stages 1 and 2 breast cancer. There is a significant correlation between the size of the tumor and the method of breast surgery used: the mean size of tumors in the OBCS group is 4 cm, while in the WLE group, it is 3.08 cm. This is different from what was published in 2019, stating that the mean size in both groups was almost the same [8].

Regarding differentiation grade, G1 was the most frequent tumor differentiation grade for both groups: 32 (64.0%). The second most frequent grade is G2 11 (22.0%) and the less frequent grade is G1 for both groups 7 (14.0%). This is different from what was published in 2019, stating that the most common is grade 2 followed by grade 3 and the least is grade 1 breast cancer [8].

Although 2 cases were positive in the WLE group only, our study shows no statistical difference regarding recurrence of breast cancer between the two groups, this is similar to the two studies published in 2017, but

Table 6 Relation between locoregional recurrence and characteristics of the tumor, chemotherapy, and radiotherapy given

	Recurrence [*n* (%)]				
	No	Local	Test value*	*P* value	Significance
Number of nodes					
No	7 (30.4)	0			
1 : 3	6 (26.1)	0	2.355	0.308	NS
>3	10 (43.5)	2 (100.0)			
Estrogen receptor status					
Negative	5 (21.7)	2 (100.0)	5.590	0.018	S
Positive	18 (78.3)	0			
Progesterone receptor status					
Negative	10 (43.5)	2 (100.0)	2.355	0.125	NS
Positive	13 (56.5)	0			
Her2					
Negative	20 (87.0)	2 (100.0)	0.296	0.586	NS
Positive	3 (13.0)	0			
Size of the closest margin					
0 ml	7 (30.4)	a1 (50.0)	0.760	0.684	NS
0–2 cm	10 (43.5)	1 (50.0)			
>2 cm	6 (26.1)	0			
Radiation therapy					
No	23 (100.0)	2 (100.0)	NA	NA	NA
Yes	0	0			
Neoadjuvant chemotherapy					
No	21 (91.3)	2 (100.0)	0.189	0.664	NS
Yes	2 (8.7)	0			
Adjuvant					
No	0	0	NA	NA	NA
Yes	23 (100.0)	2 (100.0)			
Hormonal					
No	7 (30.4)	1 (50.0)	0.324	0.569	NS
Yes	16 (69.6)	1 (50.0)			

P->0.05. *P*<0.05. *P*<0.01.

Table 7 Relation between locoregional recurrence and side, site, and postoperative results of surgery

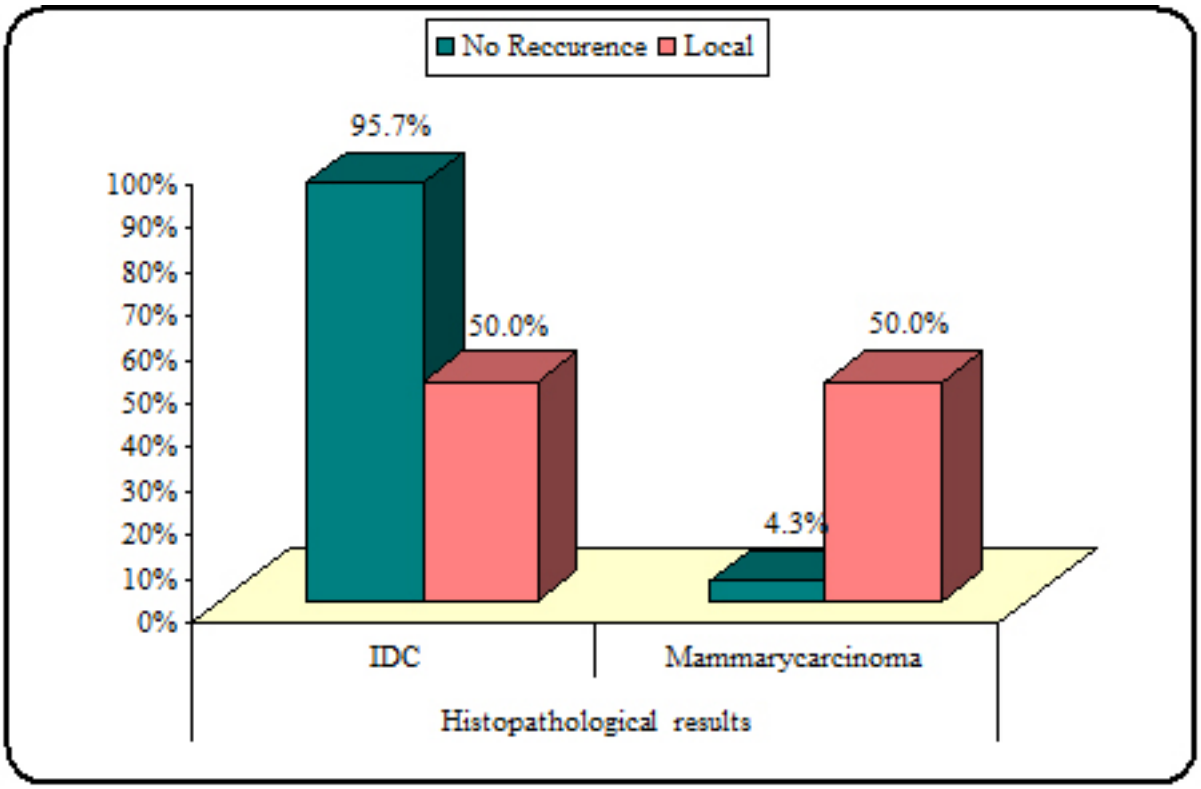
	Recurrence [*n* (%)]				
	No	Local	Test value	*P* value	Significance
Side of the tumor					
Left	12 (52.2)	1 (50.0)	0.003	0.953	NS
Right	11 (47.8)	1 (50.0)			
Site of the tumor					
UOQ	12 (52.2)	0			
LIQ	9 (39.1)	1 (50.0)	5.978	0.113	NS
UIQ	1 (4.3)	0			
LOQ	1 (4.3)	1 (50.0)			
Final pathological diagnosis					
IDC	22 (95.7)	1 (50.0)	5.210	0.022	S
Intramammary carcinoma	1 (4.3)	1 (50.0)			

IDC, intraductal carcinoma; S, significant. *P*>0.05. *P*<0.05. *P*<0.01.

we have to mention the importance of follow-up of these cases to collect data of recurrence at 3 and 5 years postoperatively [9,10].

There is a high correlation between the closest free margin and the technique of surgery used where 96% of cases undergoing OBCS had the closest free margin of more than 2 cm in comparison to 24% of cases undergoing WLE, which agrees with a study published in 2017, stating that it may be possible that wider excisions inherent to OBS may allow lower recurrences and thus making the whole postoperative retrospective debate of 0-mm versus 1-mm versus 2-mm margin rather redundant [11].

Figure 7



A graph showing histopathological results in recurrent and nonrecurrent cases.

Table 8 Cosmetic outcome of surgery in relation to pt and tumor characteristics in the wide local excision group

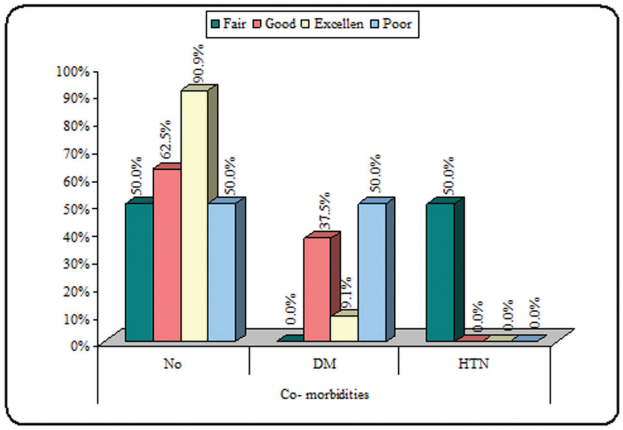
	Cosmetic outcome [*n* (%)]						
	Fair *N*=4	Good *N*=8	Excellent *N*=11	Poor *N*=2	Test value	*P* value	Significane
Age							
Mean±SD	41.75±3.10	41.63±9.02	43.82±7.76	42.50±4.95	0.152•	0.927	NS
Range	39–46	30–52	34–58	39–46			
FH							
No	4 (100)	6 (75.0)	9 (81.8)	2 (100)	1.664*	0.645	NS
Yes	0	2 (25.0)	2 (18.2)	0			
Comorbidities							
No	2 (50.0)	5 (62.5)	10 (90.9)	1 (50.0)			
DM	0	3 (37.5)	1 (9.1)	1 (50.0)	15.129*	0.019	S
HTN	2 (50.0)	0	0	0			
Medt. fever	0	0	0	0			
Size of the tumor in cm							
Mean±SD	3.50±0.58	3.25±1.58	2.73±0.90	3.50±0.71	0.685•	0.571	NS
Range	3–4	1–5	1–4	3–4			

DM, diabetes mellitus; FH, family history; HTN, hypertension; S, significance. •One-way analysis of variance test. $P>0.05$. $P<0.05$. $P<0.01$.

ER status was highly significant with locoregional recurrence being positive in 78.3 of nonrecurrent cases and negative in 100% of recurrent cases, 2/5 of ER-negative patients had locoregional recurrence. Both of the two cases were PR- and Her 2-negative (triple-negative) This is similar to what was illustrated in two studies published in 2018 and 2021, respectively [12,13].

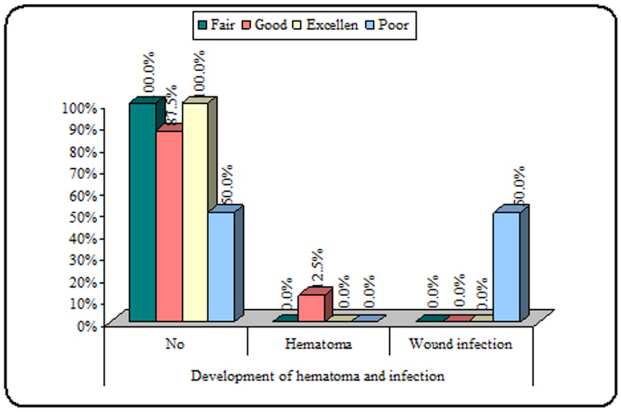
In our study age, positive family history, comorbidities, size, and grade of the tumor had no statistical significance in relation to short-term locoregional recurrence. The two cases of recurrence had more than three positive nodes at the time of surgery, but this was not statistically significant: the two cases of LR in the WLE group had the size of the closest margin less than 2 mm.

Figure 8



A graph showing the relation between comorbidities and cosmetic outcome.

Figure 9



A graph showing the correlation between development of hematoma, infection, and the cosmetic outcome.

Table 9 Relation between cosmetic outcome and characteristics of the tumor and postoperative results in the wide local excision group

	Cosmetic outcome [*n* (%)]						
	Fair	Good	Excellent	Poor	Test value*	*P* value	Significance
Side of the tumor							
Left	2 (50.0)	4 (50.0)	6 (54.5)	1 (50.0)	0.051	0.997	NS
Right	2 (50.0)	4 (50.0)	5 (45.5)	1 (50.0)			
Site of the tumor							
UOQ	1 (25.0)	7 (87.5)	3 (27.3)	1 (50.0)			
LIQ	3 (75.0)	1 (12.5)	5 (45.5)	1 (50.0)	10.715	0.296	NS
UIQ	0	0	1 (9.1)	0			
LOQ	0	0	2 (18.2)	0			
Seroma formation							
No	4 (100)	6 (75.0)	10 (90.9)	2 (100)	2.187	0.535	NS
Yes	0	2 (25.0)	1 (9.1)	0			
Development of hematoma and infection							
No	4 (100)	7 (87.5)	11 (100)	1 (50.0)			
Hematoma	0	1 (12.5)	0	0	14.130	0.028	S
Wound infection	0	0	0	1 (50.0)			
Lymphedema of the arm							
No	4 (100)	8 (100)	11 (100)	2 (100)	NA	NA	NA
Yes	0	0	0	0			
Wound dehiscence							
No	4 (100)	8 (100)	10 (90.9)	2 (100)	1.326	0.723	NS
Yes	0	0	1 (9.1)	0			
Partial nipple/flap necrosis							
No	4 (100)	8 (100)	11 (100)	1 (50.0)	11.979	0.007	HS
Yes	0	0	0	1 (50.0)			

HS, highly significant, S, significant. $P>0.05$. $P<0.05$. $P<0.01$.

This is similar to the results of a study, stating that the size of the closest margin was larger in the OBCS group and that reduced the rate of re-excision [8].

For both groups, the majority of sentinel lymph node biopsies performed resulted in similarly positive outcomes, without significant differences (P=0.513). Most tumors considered were homogeneously positive for estrogen receptor, 72% and 80% for groups A and B, respectively (P=0.508). Most tumors were also positive for progesterone receptor with slightly different frequencies, 52.0 and 56.0%, for groups A and B, respectively (P=0.777). Her2 was negative for most of the cases in both groups, 88.0 and 92.0%, respectively (P=0.637). This is similar to a study with similar statistics [8].

Regarding cosmetic outcome, in our study, there is a significant relation between diabetes mellitus and cosmetic outcome, where 20% of diabetic patients have poor cosmetic outcome. In total, 90% of patients with the excellent cosmetic outcome have no comorbidities. This is similar to a study showing the impact of diabetes mellitus in breast surgery [14].

Overall, the postoperative complication rate was similarly low; for both groups, hematoma accounted for 8% and 4% for group A (OBCS) and group B (WLE), respectively. Necrosis and wound healing accounted for 4 and 4% for group A (OBCS) and group B (WLE), respectively. Lymphedema of the arm accounted for 0 and 16%, respectively, with a highly significant correlation to OBCS in comparison to WLE.

Figure 10

Cosmotic result after wide local excision.

Conclusion

The choice of the oncoplastic surgical technique is based on the location of the tumor, size of the breast, and distance of the tumor from the nipple–areola complex. That is why the decision is tailored for every case.

In our study, a short-term follow-up period of 1.5 years of patients post OBCS versus WLE showed no

Figure 11

Results of superior-pedicle technique with nipple reconstruction.

Table 10 Cosmetic outcome of surgery in relation to pt and tumor characteristics in the oncoplastic breast conservation surgery group

	Cosmetic outcome [*n* (%)]					
	Good *N*=6	Excellent *N*=18	Poor *N*=1	Test value	*P* value	Significance
Age						
Mean±SD	36.67±6.98	48.72±7.51	48.00±0.00	6.027•	0.008	HS
Range	28–46	30–60	48–48			
FH						
No	4 (66.7)	15 (83.3)	1 (100.0)	1.042*	0.594	NS
Yes	2 (33.3)	3 (16.7)	0			
Comorbidities						
No	6 (100.0)	16 (88.9)	1 (100.0)			
DM	0	0	0	0.845*	0.932	NS
HTN	0	1 (5.6)	0			
Medt. fever	0	1 (5.6)	0			
Size of the tumor in cm						
Mean±SD	4.17±1.33	3.89±0.96	5.00±0.00	0.621•	0.547	NS
Range	2–5	2–5	5–5			

DM, diabetes mellitus; FH, family history; HS, highly significant. •One-way analysis of variance test. $P>0.05$. $P<0.05$. $P<0.01$.

Table 11 Relation between cosmetic outcome and characteristics of the tumor and postoperative results in the wide local excision group

	Cosmetic outcome [*n* (%)]					
	Good	Excellent	Poor	Test value*	*P* value	Significance
Side of the tumor						
Left	2 (33.3)	9 (50.0)	1 (100)	1.629	0.443	NS
Right	4 (66.7)	9 (50.0)	0			
Site of the tumor						
UOQ	2 (33.3)	8 (44.4)	0			
LIQ	2 (33.3)	7 (38.9)	0	5.802	0.446	NS
UIQ	2 (33.3)	2 (11.1)	1 (100)			
LOQ	0	1 (5.6)	0			
Seroma formation						
No	5 (83.3)	17 (94.4)	1 (100)	0.845	0.655	NS
Yes	1 (16.7)	1 (5.6)	0			
Development of hematoma and infection						
No	6 (100)	17 (94.4)	0			
Hematoma	0	1 (5.6)	1 (100)	12.168	0.002	HS
Wound infection	0	0	0			
Lymphedema of the arm						
No	6 (100)	14 (77.8)	1 (100)	1.852	0.396	NS
Yes	0	4 (22.2)	0			
Wound dehisence						
No	6 (100)	18 (100)	0	25.000	0.000	HS
Yes	0	0	1 (100)			
Partial nipple/flap necrosis						
No	6 (100)	18 (100)	1 (100)	NA	NA	NA
Yes	0	0	0			

HS, highly significant; S, significant. $P>0.05$. $P<0.05$. $P<0.01$.

significant difference in terms of recurrence, although it showed that there is a high correlation between the closest free margin and the technique of surgery used being larger in oncoplastic breast cancer surgery.

Recurrent cases in our study are strongly related to triple-negative hormonal receptors, this might be attributed to the short-term follow-up that is associated in many studies with recurrence in triple-negative cases.

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Conflicts of interest
There are no conflicts of interest.

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