DOI:10.31557/APJCC.2026.11.5.749

RESEARCH ARTICLE

Comparative Study between Therapeutic Mammoplasty and Conventional Breast-Conserving Surgery in Early-Stage Breast Cancer

Mohammed Siam[1], Youssef Hassan[2], Hossam Hassan Kamel Hassan[3], Mohamed Mokhtar[3], Esayed Elmokadem[4], Samia Hussein[5]*, Mayada El-metwally Ibrahim[1]

[1]General Surgery Department, Faculty of Medicine, Suez University, Egypt. [2]Plastic Surgery unit, General Surgery Department, Faculty of Medicine, Suez University, Egypt. [3]Surgical Oncology Department, Minia Oncology Center, Egypt. [4]General Surgery Department, Benha Teaching Hospital, Egypt. [5]Medical Biochemistry Department, Faculty of Medicine, Zagazig University, Egypt.

Abstract

Introduction: Conventional Breast-Conserving Surgery (BCS) is the standard management for early-stage breast tumors; however, cosmetic deformity and patient dissatisfaction may occur, particularly with larger tumors or unfavorable locations. This study aimed to compare therapeutic mammoplasty with conventional BCS regarding aesthetic outcome, patient and surgeon satisfaction, and postoperative complications. **Materials and Methods:** This phase II comparative study included 60 female patients with early-stage breast cancer (stage I–II) treated between October 2023 and January 2026 at Suez University and Minia Oncology Center. Patients were enrolled into two groups. Group A included 30 patients who had therapeutic mammoplasty, while Group B included 30 patients who had conventional BCS. **Results:** There were no statistically significant differences between the two groups regarding local recurrence and distant metastasis (P>0.05). Therapeutic mammoplasty was associated with significantly longer hospital stay and delayed initiation of adjuvant therapy (P < 0.001). However, aesthetic outcomes were significantly better in the therapeutic mammoplasty group, with 73.3% achieving good cosmetic results compared to 33.3% in the conventional BCS group (P=0.002). Additionally, the re-excision rate was significantly lower in the therapeutic mammoplasty group (P = 0.023). Moreover, patient and surgeon satisfaction were significantly higher following therapeutic mammoplasty. Furthermore, overall complication rates were significantly lower in the therapeutic mammoplasty group (P=0.004), with postoperative infection occurring more frequently after conventional BCS. **Conclusion:** Therapeutic mammoplasty provides superior cosmetic outcomes, higher patient and surgeon satisfaction, and fewer overall complications than conventional BCS, supporting its use in selected cases with early-stage breast cancer.

Keywords: Therapeutic mammoplasty- Breast-conserving surgery- Oncoplastic breast surgery- Early-stage breast cancer

Asian Pac J Cancer Care, **11 (5)**, 749-757

Submission Date: 05/29/2026 Acceptance Date: 07/28/2026

Introduction

Globally, breast cancer is a predominant cancer among women, accounting for approximately thirty-nine percent of malignancies. In Egypt, it accounts for 32.04% of female malignancies. This is exacerbated by delayed presentation, as 49.7% of patients exhibit regional spread at diagnosis, while 11.9% have distant metastases. However, due to screening programs and increased awareness, a greater percentage of females are identified at early stages and qualify for oncoplastic breast surgery [1].

Breast-conserving treatment is the conventional approach for early-stage breast cancer. Its principal objective is to secure tumor-free resection margins, delivering a therapy as efficacious as mastectomy while preserving the breast [2].

In certain cases, achieving aesthetically pleasing outcomes may prove challenging, particularly with

Corresponding Author:
Dr. Samia Hussein
Medical Biochemistry Department, Faculty of Medicine, Zagazig University, Egypt.
Email: samiahussein82@hotmail.com

large breast tumors relative to breast size, or with ill-defined or poorly positioned tumors. Oncoplastic breast surgery (OBS) integrates a plastic technique with breast-conserving surgery to facilitate extensive excision with prompt restoration of substantial resection defects [3].

Excising ten to twelve percent of breast tissue is the maximum permissible in breast-conserving therapy. Beyond this threshold, compromised cosmetic results arise, particularly for large masses in the upper outer or inner quadrants of the breast. The novel oncoplastic methods, particularly therapeutic mammoplasty, facilitate the removal of 200-500 grams from challenging tumor sites, such as the upper inner quadrant or the upper pole of the breast [4].

The traditional Breast-Conserving Surgery (BCS) approaches resulted in significant asymmetry and a pronounced deviation of the nipple-areola complex (NAC). Proficient pedicle mammoplasty techniques can consistently maintain adequate perfusion of the NAC, facilitating the excision of larger masses at greater distances from the NAC, with additional bilateral breast reduction [1].

This research aimed to compare therapeutic mammoplasty versus BCS for optimal aesthetic outcomes and maximal case satisfaction following mastectomy in early-stage breast cancer.

Materials and Methods

Sample Size and Grouping

A systematic random sampling method was used. Sample size calculation utilizing the G*Power Software (v3.1.9) indicated that 60 patients (30 per group) were needed to detect a moderate influence size (0.5) with eighty percent power and a 5% margin of error. Patients were divided into two groups: Group A (n = 30): therapeutic mammoplasty and Group B (n = 30): conventional breast-conserving surgery (BCS).

This phase II comparative research was performed on 60 female patients with early-stage breast cancer at the General Surgery Department, Suez University, and Minia Oncology Center between October 2023 and January 2026. The included females were between 20 and 65 years old with a confirmed early-stage breast cancer (Stage I or II) through histopathological evaluation. Tumors were located in the upper quadrants (outer, inner, or 12 o'clock position), either near or distant from the NAC. The breast mass was of average to large size with mild, moderate, or marked ptosis. Only patients with a primary tumor stage (T1-T2) with a tumor size ≤ 5 cm were included.

Ethical Consideration

The data acquired from participants are confidential. The research participants were not named in any report or publication related to this research. Before the participants' admission to the research, the study's aim, nature, and risk–benefit evaluation were elucidated to them. Consent has actually been obtained.

Exclusion criteria included advanced breast cancer (Stage III–IV), multicentric disease, invasive lobular carcinoma, inflammatory carcinoma, NAC involvement, tumors in the lower half of the breast, prior breast surgery or irradiation, recurrent malignancy, or contraindications to BCS.

Preoperative Assessment

All patients had complete history taking, physical examination, and routine laboratory investigations. Additionally, imaging studies (sonomammography) and core needle biopsy were performed. Tumor staging was performed according to the AJCC TNM classification. A multidisciplinary team reviewed patient data to determine the optimal surgical approach. Surgical choice was made upon patient preference, surgeon recommendation, breast size, ptosis, tumor location, and tumor-to-breast ratio. Patients were photographed in (P.A, RT oblique, RT lateral, LT oblique, and LT lateral) positions.

Surgical Techniques

Inferior pedicle mammoplasty was performed bilaterally in a single operative session, with preoperative standing markings identifying the tumor location on the affected breast; two vertical lines have been drawn from the midclavicular point through the nipple to the inframammary fold, a central line from the suprasternal notch to the umbilicus, and an inverted V with its apex at the future nipple, from which two horizontal lines extended laterally to the inframammary fold to determine nipple position. Surgical markings are demonstrated in Figure 1. The breast mound vascular pedicle supporting the parenchyma and NAC was based inferiorly with a base width of six to twelve centimeters. Skin incisions followed the markings to permit tumor excision with safety margins from the affected breast and a comparable volume of parenchyma from the contralateral breast. The skin overlying the tumor was undermined according to the mammoplasty design, and the mass was excised with circumferential margins down to the pectoralis major muscle. All margins were stitch-marked and sent for frozen-section histopathology, with a 5-mm margin considered negative. Surgical clips have been situated in the tumor bed to aid radiotherapy following the operation. Axillary surgery consisted of either sentinel lymph node biopsy (SLNB) or axillary lymph node dissection (ALND) according to tumor stage and nodal status.

Conventional BCS included a wide local excision.

Figure 1. A. Pre-operative marking of inferior Pedicle mammoplasty; B. One-week post-operative; C. Pre-operative conventional Breast-Conserving Surgery (BCS); D. Immediate post-operative of conventional Breast-Conserving Surgery (BCS).

Closure was performed via direct approximation of breast tissue and skin (or minor mobilization). Tumor excision was performed without glandular rearrangement or volume displacement techniques. No oncoplastic glandular reshaping or contralateral symmetrization procedures were performed. All procedures were performed by senior surgeons experienced in their respective techniques, minimizing potential learning curve bias.

Oncologic Safety Assessment

Margin status was assessed intraoperatively using frozen section and confirmed by final histopathology. A negative margin (R0 resection) was defined as no tumor cells within 5 mm of the resection edge. Re-excision was performed in cases with positive margins. Local recurrence and distant metastasis were recorded during follow-up visits.

Outcome Measurements and Follow-up

For all operated patients, hospital admission was maintained overnight until adequate oral intake was achieved. A standardized regimen of intravenous antibiotics was administered intraoperatively and continued for 24 hours postoperatively, followed by a 5-day course of oral antibiotics. Postoperative pain control consisted of intravenous NSAIDs and paracetamol during the first 24–48 hours, with a transition to oral analgesics at discharge according to individual patient requirements. Patients were instructed to undergo gradual mobilization of the ipsilateral arm. Surgical drains were removed once the output was below 30 cc over 24 hours, and sutures were removed on postoperative day 15. Scar management was initiated 2–3 weeks after surgery, once complete wound healing had occurred, using silicone gel or sheets and gentle massage. Adjuvant therapy (chemotherapy, radiotherapy, endocrine therapy, or combined regimens) was administered according to tumor biology and multidisciplinary team recommendations. Radiotherapy planning was performed according to institutional standards and was not significantly different between groups.

Postoperative Assessment

Postoperative assessment was conducted during the early period at the 1st visit, 10 days after surgery, focusing on the viability of the NAC on both sides, wound status, including infection or dehiscence, and the presence of seroma, hematoma, or flap necrosis at the operative site. Late postoperative evaluation at the 2nd visit, one month following surgery, assessed breast and nipple symmetry, patient satisfaction, and delayed wound complications such as the formation of keloid or scar hypertrophy, with additional follow-ups at 3 and 6 months. The final assessment at 12 months evaluated esthetic appearance by a blinded physician evaluation based on radiographic imaging. All cases have been monitored for local recurrence and metastasis every three months during the 1st year and every 6 months thereafter through physical examination, sonomammography or breast MRI when recurrence has been suspected, pelviabdominal ultrasound, CT of the chest and brain, and bone scanning.

Statistical Analysis

Statistical analysis was done utilizing SPSS version 25. Continuous variables were expressed as mean ± SD and median (range). Categorical variables were presented as frequencies and percentages. An independent t-test or Mann–Whitney U test was used for continuous variables as appropriate. Chi-square or Fisher's exact test was applied for categorical variables. Multivariate logistic regression was done to adjust for potential confounders when analyzing cosmetic outcomes and satisfaction. Ninety-five percent confidence intervals (95% CI) were calculated for mean differences and proportions. A P-value < 0.05 was considered statistically significant. As multiple outcomes were analyzed, results should be interpreted as exploratory.

Results

There were no statistically significant differences between the two groups in age, tumor stage, tumor size, tumor location, or surgical margin status ($P>0.05$). Additionally, the distribution of adjuvant treatment modalities was comparable between groups ($P = 0.783$), indicating comparable baseline and oncologic characteristics. However, therapeutic mammoplasty was significantly associated with larger breast size ($P = 0.006$) and a different BMI distribution compared to BCS ($P = 0.034$) (Table 1).

Regarding axillary surgery, there was no statistically significant difference between the two groups in either the performance of axillary surgery ($P = 0.292$) or the type of procedure performed (SLNB vs. ALND, $P = 0.347$), indicating that axillary management was similar and not influenced by the choice of breast surgical technique. The re-excision rate was significantly lower in the therapeutic mammoplasty group (3% vs. 23%, $P = 0.023$), suggesting improved margin clearance with the oncoplastic technique (Table 1).

The mean follow-up period was 29.9 ± 8.3 months (median 33, range 9–41) in the therapeutic mammoplasty group and 35.6 ± 9.5 months (median 37, range 12–49) in the BCS group, with a statistically significant difference ($P=0.016$). This follow-up duration allows preliminary assessment of oncologic outcomes, including local recurrence and distant metastasis. There were no statistically significant differences between the two groups regarding local recurrence and distant metastasis ($P>0.05$) (Table 1).

Therapeutic mammoplasty was associated with a significantly longer hospital stay and a delayed initiation of adjuvant therapy compared to BCS ($P < 0.001$ for both). However, it resulted in significantly better aesthetic outcomes, with a higher proportion of good cosmetic results ($P = 0.002$) (Table 2).

Patient satisfaction was significantly higher in the therapeutic mammoplasty group than in the BCS group. The median satisfaction score was 3 (Good) versus 2.5

Table 1. Baseline Characteristics of the Study Population

	Therapeutic Mammoplasty (%) N=30	Breast-conserving Surgery (%) N=30	Test	P-value
Age (years)			T=1.44	0.156
Mean ± SD	44.57±7.17	47.27±7.36		
Median (min-max)	44 (31-59)	46.50 (33-62)		
95% Confidence Interval				
Lower Bound	41.89	44.52		
Upper Bound	47.24	50.02		
BMI (kg/m²)				
< 25 kg/m²	11 (36)	7 (23.3)		
25–30 kg/m²	17 (57)	13 (43.3)	X^2= 6.756	0.034*
> 30 kg/m²	2 (7)	10 (33.3)		
T stage				
Stage I	6 (20%)	7 (2)		
Stage II	23 (77)	23 (77)	X^2= 1.077	0.585
Stage III	1 (3)	0 (0)		
Tumor size (mm)				
T1≤20 mm	19 (63)	25 (83)		
T2 21–50 mm	11 (37)	5 (17)	X^2= 3.068	0.216
T3≥50 mm	0 (0)	0 (0)		
Tumor location				
Upper lateral	12 (40)	12 (40)		
Upper medial	2 (7)	4 (13)		
Lower lateral	3 (10)	3 (10)	X^2= 2.029	0.845
Lower medial	2 (7)	2 (7)		
Central	5 (16)	2 (7)		
Overlapping regions	6 (20)	7 (23)		
Breast size				
Cup A	2 (7)	12 (40)		
Cup B	16 (53)	15 (50)	X^2= 12.62	0.006*
Cup C	7 (23)	2 (7)		
Cup D	5 (17)	1 (3)		
Adjuvant therapy				
Radiotherapy	1 (3)	1 (3)		
Chemotherapy	1 (3)	1 (3)		
Hormone therapy	0 (0)	0 (0)		
Hormone + radiotherapy	1 (3)	0 (0)	X^2= 3.2	0.783
Radio + chemotherapy	14 (47)	10 (33)		
Hormone + chemotherapy	0 (0)	1 (3)		
All three therapies	13 (43)	17 (57)		
Axillary surgery				
No	16 (53)	20 (67)	X^2= 1.111	0.292
Yes	14 (47)	10 (33)		
Axillary approach				
SLNB	22 (73)	25 (83)	X^2= 0.884	0.347
ALND	8 (27)	5 (17)		
Surgical margin				
>2 mm	27 (90)	25 (83)	X^2= 0.577	0.447
>10 mm	25 (83)	23 (77)	X^2= 0.417	0.518
Margin positive	3 (10)	3 (10)	X^2= 0	1
Re-excision	1 (3)	7 (23)	X^2= 5.192	0.023*
Follow-up period (months)				
Mean ± SD	29.9 ± 8.3	35.6 ± 9.5		
Median (min-max)	33 (9–41)	37 (12–49)	T=2.48	0.016*
Local recurrence	0 (0)	1 (3)	X^2= 1.017	0.313
Distant metastasis	5 (17)	5 (17)	X^2= 0	1

X^2: Chi-Square test; SLNB: sentinel lymph-node biopsy; ALND: axillary lymph-node dissection; *: P value <0.05 is statistically significant

Table 2. Comparative Analysis between Therapeutic Mammoplasty and Breast-conserving Surgery between the Studied Groups

			Therapeutic Mammoplasty	Breast-conserving Surgery		P-value
			N=30	N=30	Test	
Adjuvant therapy start (days)						
Mean ± SD			33.57±5.39	26.97±3.62		<0.001**
Median (min-max)			36 (24-41)	27 (19-37)	U=160.5	
95% Confidence Interval						
Lower Bound			31.55	25.61		
Upper Bound			35.58	28.32		
Hospital stay						
Mean ± SD			4.05±0.93	2.7±0.73		<0.001**
Median (min-max)			4 (2-6)	2.95 (2-4)	U=131	
95% Confidence Interval						
Lower Bound			3.7	2.46		
Upper Bound			4.4	3		
Aesthetic Outcome	Poor	N	3	2	X^2=12.04	0.002*
		%	10.00	6.70		
	Fair	N	5	18		
		%	16.70	60.00		
	Good	N	22	10		
		%	73.30	33.30		

U: Mann-Whitney Test; X^2: Chi-Square test, *: a significant difference, **: a highly significant difference

(Fair), with a mean ± SD of 3.37 ± 0.49 versus 2.47 ± 0.78, respectively (P < 0.001). These results indicate that patients undergoing therapeutic mammoplasty reported markedly better overall satisfaction (Table 3).

Overall complications were significantly lower in the therapeutic mammoplasty group (P= 0.004), with a higher rate of complication-free patients (P= 0.004). Infection was more frequent after BCS (P= 0.02), while other complications showed no significant difference (Table 4).

In the logistic regression model, with a good aesthetic outcome as the dependent variable, the type of operative procedure was significantly associated with achieving a good aesthetic result. Therapeutic mammoplasty patients had 5.5 times higher odds than BCS (OR = 5.50, 95% CI: 1.813–16.681, P = 0.003). Age and operation time showed borderline associations but did not reach statistical significance. These findings suggest that surgical technique is a key determinant of good aesthetic outcomes after adjusting for potential confounders (Table 5).

Regarding hospital stay, univariable linear regression showed that hospital stay was significantly associated with operative procedure and operation time. Patients undergoing therapeutic mammoplasty had a longer hospital stay than BCS (B = 1.323, 95% CI: 0.888–1.759, P < 0.001). A longer operation time was also associated with increased hospital stay (B = 0.028, 95% CI: 0.016–0.040, P < 0.001). Age was not significantly associated with hospital stay (P = 0.327) (Table 6). In multivariable linear regression analysis, the surgical procedure remained a significant independent predictor of hospital stay. Patients undergoing therapeutic mammoplasty had, on average, 1.04 days longer hospital stay than BCS (95% CI: 0.444–1.635, P = 0.001), after adjusting for operation time. Operation time was not a significant independent predictor in this model (B = 0.010, 95% CI: -0.005–0.025, P = 0.171). These results indicate that surgical technique,

Table 3. Comparison of Patient Satisfaction between Studied Groups

	Therapeutic Mammoplasty	Breast-conserving Surgery	Test	P-value
	N=30	N=30		
Patient Satisfaction				
Mean ± SD	3.37±0.49	2.47±0.78		
Median (min-max)	3 (3-4)	2.50 (1-4)	U=172.5	<0.001**
95% Confidence Interval				
Lower Bound	3.18	2.18		
Upper Bound	3.55	2.76		

U: Mann-Whitney Test.; **: a highly significant difference

Table 4. Comparison of Complications between the Studied Groups

		Therapeutic Mammoplasty N=30	Breast-conserving Surgery N=30		P-value
Overall complications	N	3	13	X^2= 8.52	0.004*
	%	10	43.30		
None	N	27	17	X^2= 8.52	0.004*
	%	90	56.70		
Seroma	N	2	7	X^2= 3.26	0.071
	%	6.70	23.30		
Infection	N	0	5	X^2= 5.45	0.02*
	%	0.00	16.70		
Fat necrosis	N	0	0	X^2=0	1
	%	0.00	0.00		
NAC necrosis	N	0	0	X^2=0	1
	%	0.00	0.00		
Wound dehiscence	N	1	1	X^2=0	1
	%	3.30	3.30		

X^2: Chi-Square test, *: a significant difference

Table 5. Logistic Regression for Good Aesthetic Outcome

	B	S.E.	Sig.	OR	95% CI	
					Lower	Upper
Operative procedure	1.705	0.566	0.003*	5.5	1.813	16.681
Age	-0.067	0.038	0.08	0.935	0.868	1.008
Operation Time	0.027	0.014	0.057	1.027	0.999	1.056

*: a significant difference

Table 6. Univariable Linear Regression for Hospital Stay (Days)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% CI for B	
	B	Standard Error	Beta			Lower Bound	Upper Bound
Operative Procedure	1.323	0.218	0.624	6.083	<0.001**	0.888	1.759
Age	-0.019	0.019	-0.129	-0.989	0.327	-0.057	0.019
Operation Time	0.028	0.006	0.532	4.781	<0.001**	0.016	0.04

**: a highly significant difference

rather than operation duration, primarily influences hospital stay when both factors are considered together (Table 7).

Regarding patient satisfaction, univariable ordinal logistic regression showed that the surgical procedure was strongly associated with patient satisfaction. Patients undergoing therapeutic mammoplasty were significantly more likely to report higher satisfaction than BCS (Estimate = -3.126, 95% CI: -4.706 to -1.546, P < 0.001). Operation time was also significantly associated with patient satisfaction, with longer surgeries slightly increasing satisfaction (Estimate = 0.028, 95% CI: 0.002–0.053, P = 0.032). Age was not significantly associated with patient satisfaction (P = 0.927). Overall, surgical technique was the strongest predictor of patient satisfaction in the univariable analysis (Table 8). A multivariable ordinal logistic regression model showed that the surgical procedure was strongly associated with patient satisfaction. Patients undergoing therapeutic mammoplasty were significantly more likely to report higher satisfaction compared with BCS (Estimate = -3.906, 95% CI: -5.836 to -1.977, P < 0.001). Operation time was not significantly associated with patient satisfaction (Estimate = -0.027, 95% CI: -0.062 to 0.009, P = 0.146). Overall, surgical technique remained the strongest predictor of patient satisfaction in the multivariable analysis (Table 9).

Discussion

BCS accompanied by radiotherapy, is the standard treatment for most cases with early-stage breast cancer; however, the aesthetic results of this procedure are not always satisfactory. Oncoplastic breast surgery (OBS) represents an innovative approach that ensures safe and effective treatment of the malignant lesion while attaining optimal aesthetic results [5].

Table 7. Multivariable Linear Regression for Hospital Stay (Days)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% CI for B	
	B	Standard Error	Beta			Lower Bound	Upper Bound
Surgical Procedure	1.04	0.297	0.49	3.496	0.001*	0.444	1.635
Operation Time	0.01	0.007	0.194	1.386	0.171	-0.005	0.025

*: a significant difference

Table 8. Univariable Ordinal Logistic Regression for Patient Satisfaction

	Estimate	Standard Error	Sig.	95% CI	
				Lower Bound	Upper Bound
Surgical Procedure	-3.126	0.806	<0.001**	-4.706	-1.546
Age	-0.003	0.034	0.927	-0.069	0.063
Operation Time	0.028	0.013	0.032*	0.002	0.053

*: a significant difference, **: a highly significant difference

Table 9. Multivariable Ordinal Logistic Regression for Patient Satisfaction

	Estimate	Standard Error	Sig.	95% CI	
				Lower Bound	Upper Bound
Surgical Procedure	-3.906	0.985	<0.001**	-5.836	-1.977
Operation Time	-0.027	0.018	0.146	-0.062	0.009

**: a highly significant difference

This study found that the two groups were of matched age. In alignment with our study, Behluli et al (2019) [6] reported no statistically significant difference in age between OBS and BCS.

The present research detected a highly statistically significant difference in postoperative outcomes between the two studied groups. Patients who underwent therapeutic mammoplasty had a significantly longer time before starting adjuvant therapy and a longer hospital stay than those in the BCS group. In agreement with our study Fawzy et al (2020) [7], in their prospective randomized research, found that females with upper inner quadrant early breast cancer who were candidates for OBS had a highly statistically significant difference regarding hospital stay.

Although therapeutic mammoplasty in our study was associated with a statistically significant delay in initiation of adjuvant therapy (mean difference approximately 6 days), this delay remained well below the clinically critical threshold of 8 weeks reported in the literature. Therefore, the difference is unlikely to negatively impact oncologic outcomes. Strategies to minimize delay include optimized wound care and enhanced recovery protocols. Additionally, our study agrees with Abu Elnga et al [8], who demonstrated that adjuvant chemotherapy or radiation therapy was not significantly delayed by therapeutic mammoplasty, even when different mammoplasty techniques (Benelli versus pedicle) were used, consistent with the premise that well-managed oncoplastic procedures can deliver adjuvant therapy on time. However, McIntosh et al [9] reported that therapeutic mammoplasty has comparable delay rates to standard BCS. Only ~6 % of therapeutic mammoplasty cases led to delayed adjuvant therapy in earlier research. This highlights the importance of standardized definitions for "delay" in contemporary comparative analyses.

The current research demonstrated a statistically significant difference in aesthetic outcomes between the two groups. The therapeutic mammoplasty group showed a higher proportion of good aesthetic outcomes compared to the BCS group. On the other side, fair outcomes were more common among patients who underwent BCS surgery. This indicates that therapeutic mammoplasty was associated with more favorable overall aesthetic results.

Similarly, De La Cruz et al (2016) [10] aimed to assess current practice and results of therapeutic mammoplasty in the UK. Their results included an unplanned reoperation for complications within 1 month of the procedure. They also reported that oncoplastic BCS achieved good, excellent, fair, or poor results in (31.0%, 55.2%, 9.4% and 4.4%) of cases, respectively.

Also, Wijesinghe et al (2023) [11] reported that re-excision rates were significantly lower in the oncoplastic BCS group. Additionally, a statistically significant difference in aesthetic outcome, including nipple position and scar visibility, was detected between oncoplastic BCS and BCS. Oncoplastic BCS showed an overall better aesthetic result.

Moreover, Losken et al (2017) [12] in their study on lumpectomy and reduction mammoplasty demonstrated an overall improvement in aesthetic-related outcomes, including appearance in the mirror (clothed and unclothed), ability to wear more fitted clothes, perceived femininity in clothing, overall attractiveness, and breast appearance when unclothed. However, most aesthetic items did not reach statistical significance. However,

there was a statistically significant improvement in body acceptance.

The present research demonstrated a highly significant difference in patient satisfaction between the two groups. Cases in the therapeutic mammoplasty group reported greater satisfaction levels, with a greater proportion rating their experience as good or excellent. In contrast, the BCS group had higher fair and poor satisfaction. These findings indicate that therapeutic mammoplasty was associated with substantially better patient satisfaction outcomes. Our results are supported by Abdelkader et al (2023) [13], who found a highly significant difference in cosmetic result assessed by the surgeon between the OBS and BCS groups. Patients who underwent OBS reported higher satisfaction levels, with most ratings falling into the excellent and good categories. In contrast, the BCS group had a higher proportion of fair and poor satisfaction ratings. These results indicate that therapeutic mammoplasty was associated with markedly greater surgeon satisfaction compared to BCS.

The present research demonstrated a significant difference in overall complication rates between the two studied groups. Cases in the therapeutic mammoplasty group had significantly fewer overall complications compared to those who underwent BCS. Similarly, the proportion of cases with no complications was significantly higher in the therapeutic mammoplasty group. Concerning individual complications, infection was more frequent in the BCS group. However, there were statistically insignificant differences between the two groups regarding seroma, fat necrosis, NAC necrosis, or wound dehiscence.

In contrast with our study, Oh et al (2021) [14] detected no significant differences in long-term ipsilateral breast tumor recurrence (IBTR) and recurrence-free survival (RFS) between the OBS and conventional BCS groups in their retrospective analysis. Additionally, they revealed a statistically nonsignificant difference between OBS and BCS in overall complications. However, no statistically significant differences between the two groups in seroma or wound dehiscence were detected. Our results also disagreed with those of Behluli et al (2019) [6], whose study was conducted on cases with primary non-metastatic breast tumors who were subjected to BCS or OBS. An insignificant difference between the 2 procedures in overall complications was detected. Additionally, patients in the BCS group had fewer overall complications compared to those in the OBS group. This discrepancy in results can be explained by variations in research design, patient selection, surgical techniques, or sample size.

Limitations

A major limitation of this research is the relatively short oncologic follow-up period. While early recurrence data were monitored, longer follow-up is required to better evaluate local recurrence, distant metastasis, and disease-free survival outcomes. Learning curve bias is another possible limitation. Moreover, there is a potential for selection bias, which is inherent to non-randomized comparative designs.

In conclusion, therapeutic mammoplasty demonstrated superior cosmetic outcomes, higher patient and surgeon satisfaction, and lower overall complication rates compared with conventional BCS. Oncologic safety in terms of margin status was comparable between groups. Although associated with a modest delay in adjuvant therapy initiation, the delay was not clinically significant. A longer follow-up is required to confirm long-term oncologic outcomes. Thus, OBS can be an oncologically and surgically safe alternative to conventional BCS for early breast tumors.

Recommendation

Larger randomized controlled trials with long-term follow-up are required to validate these findings and assess survival outcomes.

Declarations

Ethical approval and consent to participate: This study got approval from the Faculty of Medicine, Suez University, Suez, Egypt (SUEZ Med-IRB Approval No:62 Date: 5/3/2025). Informed consent was obtained from all participants.

Availability of data and material

Available upon a reasonable request from the author.

Competing interests

The authors declare that there is no conflict of interest.

Authors' contributions

MS, YH, MEI contributed to the study conception and design. All authors were responsible for the methodology, and statistical analysis of data. SH, HHKH wrote the manuscript draft. All authors read and approved the final manuscript.

Funding

None.

Originality Declaration for Figures

All figures included in this manuscript are original and have been created by the authors specifically for the purposes of this study. No previously published or copyrighted images have been used. The authors confirm that all graphical elements, illustrations, and visual materials were generated from the data obtained in the course of this research or designed uniquely for this manuscript.

Acknowledgements

Not applicable.

References

1. Shehata M, Rizk MA, Fouad H, Mostafa TA, Hassan Y. Therapeutic mammoplasty: is it a solution for treatment of early breast cancer? The Egyptian Journal of Plastic and Reconstructive Surgery. 2021;45(4):201-210
2. Patrianagara A, Hwei LRY. Endoscopy-assisted breast conservation surgery (E-BCS) vs conventional breast conservation surgery (C-BCS) technique for the management of early breast cancer: A systematic review and meta-analysis. Breast Disease. 2023;42(1):383-393. https://doi.org/10.3233/BD-230023
3. Rutherford CL, Barker S, Romics L. A systematic review of oncoplastic volume replacement breast surgery: oncological safety and cosmetic outcome. Annals of the Royal College of Surgeons of England. 2022 01;104(1):5-17. https://doi.org/10.1308/rcsann.2021.0012
4. Douvetzemis SE, Kovacs T. Concept, principles and indication of oncoplastic breast surgery: fashion or necessity. In Oncoplastic Breast Surgery Techniques for the General Surgeon 2020 May 23 (pp. 1-33). Cham: Springer International Publishing.
5. Calì Cassi L, Vanni G, Petrella G, Orsaria P, Pistolese C, Lo Russo G, Innocenti M, Buonomo O. Comparative study of oncoplastic versus non-oncoplastic breast conserving surgery in a group of 211 breast cancer patients. European Review for Medical and Pharmacological Sciences. 2016 07;20(14):2950-2954.
6. Behluli I, Le Renard P, Rozwag K, Oppelt P, Kaufmann A, Schneider A. Oncoplastic breast surgery versus conventional breast-conserving surgery: a comparative retrospective study. ANZ journal of surgery. 2019 Oct;89(10):1236-1241. https://doi.org/10.1111/ans.15245
7. Fawzy FS, Gerges WB, Abdelshafy AA. Inferior pedicle mammoplasty vs round block technique for early-stage upper inner quadrant breast cancer. The Egyptian Journal of Surgery. 2020 Dec;39(4):1046. https://doi.org/10.4103/ejs.ejs_170_20
8. Abu Elnga NE, Anwer MN, Farghaly AA, Ayoub MT. Therapeutic Mammoplasty Doesn't Delay Adjuvant Therapy for Breast Cancer Patients. The Egyptian Journal of Surgery. 2025 Oct 01;44(4):1156-1160. https://doi.org/10.21608/ejsur.2025.358304.1380
9. McIntosh J, O'Donoghue JM. Therapeutic mammaplasty--a systematic review of the evidence. European Journal of Surgical Oncology: The Journal of the European Society of Surgical Oncology and the British Association of Surgical Oncology. 2012 03;38(3):196-202. https://doi.org/10.1016/j.ejso.2011.12.004
10. De La Cruz L, Blankenship SA, Chatterjee A, Geha R, Nocera N, Czerniecki BJ, Tchou J, Fisher CS. Outcomes After Oncoplastic Breast-Conserving Surgery in Breast Cancer Patients: A Systematic Literature Review. Annals of Surgical Oncology. 2016 Oct;23(10):3247-3258. https://doi.org/10.1245/s10434-016-5313-1
11. Wijesinghe K, Abeywickrama T, Chamara Y, De Silva S, Tharshan S, Jayarajah U, De Silva A. Oncoplastic breast conserving surgery versus standard breast conserving surgery for early and locally advanced breast cancer: a retrospective analysis from Sri Lanka. BMC surgery. 2023 09 11;23(1):273. https://doi.org/10.1186/s12893-023-02182-5
12. Losken A, Hart AM, Broecker JS, Styblo TM, Carlson GW. Oncoplastic Breast Reduction Technique and Outcomes: An Evolution over 20 Years. Plastic and Reconstructive Surgery. 2017 04;139(4):824e-833e. https://doi.org/10.1097/PRS.0000000000003226
13. Abdelkader AA, El-Fayoumi T, Roushdy A, Asal MF. Comparison between conventional and oncoplastic breast surgeries regarding resection margins and local recurrences in breast cancer: Retrospective study. The Egyptian Journal of Surgery. 2023 Dec;42(4):938. https://doi.org/10.4103/ejs.ejs_182_23
14. Oh MY, Kim Y, Kim J, Cheun JH, Jung JG, Kim HK, Lee HB, Han W. Comparison of long-term oncological outcomes in oncoplastic breast surgery and conventional breast-conserving surgery for breast cancer: a propensity score-matched analysis. Journal of breast cancer. 2021;24(6):520. https://doi.org/10.4048/jbc.2021.24.e52