



ORIGINAL RESEARCH PAPER

Surgery

ONCOPLASTIC BREAST SURGERY OUTCOMES: A HOSPITAL-BASED REVIEW

KEY WORDS:

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INTRODUCTION

Breast cancer remains the most frequently diagnosed malignancy and a leading cause of cancer-related mortality among women worldwide. The therapeutic landscape for this disease has evolved significantly over the decades, moving from radical, disfiguring mastectomies towards a paradigm centered on breast conservation. The seminal clinical trials of the 1970s and 1980s established Breast-Conserving Surgery (BCS) followed by radiotherapy as the standard of care for early-stage breast cancer, demonstrating equivalent survival outcomes to mastectomy while preserving the native breast (Fisher et al., 2002). This shift represented a monumental advance, prioritizing not just oncological cure but also the patient's quality of life and bodily integrity.

However, conventional BCS has its inherent limitations. While effective for small tumors in favorable locations, its application can be challenging for larger tumors or those situated in cosmetically sensitive areas like the lower pole or central quadrant. Attempting to achieve wide negative margins in these scenarios often results in significant breast tissue resection, leading to post-operative deformities, asymmetry, nipple-areolar complex deviation, and "bird's beak" deformities. These unsatisfactory cosmetic outcomes can cause substantial psychological distress, negatively impacting a patient's body image, self-esteem, and overall quality of life (Rose et al., 2020). This therapeutic gap between effective cancer excision and acceptable cosmetic results catalyzed the development and refinement of a more sophisticated surgical approach: oncoplastic breast surgery (OPS).

Oncoplastic surgery represents the synergistic integration of oncological surgical principles with plastic surgical techniques. The term "oncoplastic" itself underscores its dual objective: 'onco' for complete tumor removal with clear margins, and 'plastic' for optimal aesthetic restoration of the breast form. This approach broadens the indications for BCS, allowing surgeons to tackle larger tumors and more complex locations that would have previously necessitated a mastectomy (Chauhan & Sharma, 2015; Cantürk et al., 2021). The fundamental principle involves extensive tissue remodeling following wide local excision, utilizing techniques such as glandular redistribution, local flaps, and volume replacement or displacement strategies to correct the tissue defect and maintain the natural contour and symmetry of the breast.

The evolution of OPS has been rapid and impactful. As noted by Cavalcante et al. (2025), OPS is no longer a niche specialty but a critical component of comprehensive breast surgical

training and practice. Its adoption has been shown to significantly increase breast-conserving rates. A large retrospective cohort study by Reid et al. (2024) involving 3,875 procedures demonstrated that the implementation of an advanced oncoplastic surgery service directly correlated with a marked increase in BCS rates, allowing more women to avoid mastectomy without compromising oncological safety. This is a crucial public health achievement, as preserving the breast can have profound positive implications for a patient's psychological recovery.

The evidence base supporting OPS continues to grow, with numerous studies reporting favorable outcomes. Research consistently indicates that OPS achieves wider surgical margins, potentially reducing the risk of positive margins and the need for re-excision surgeries, a known drawback of conventional BCS (Chauhan & Sharma, 2015). Furthermore, the cosmetic outcomes are consistently superior. A matched cohort study by Chou et al. (2024) found that patients undergoing OPS had significantly better cosmetic scores as assessed by both clinicians and through patient-reported outcome measures (PROMs). This focus on the patient's perspective is paramount. Studies specifically investigating PROMs reveal that patients who undergo OPS report higher satisfaction with their breasts, superior psychosocial well-being, and improved sexual function compared to those treated with conventional BCS (Rose et al., 2020; DiPasquale et al., 2022).

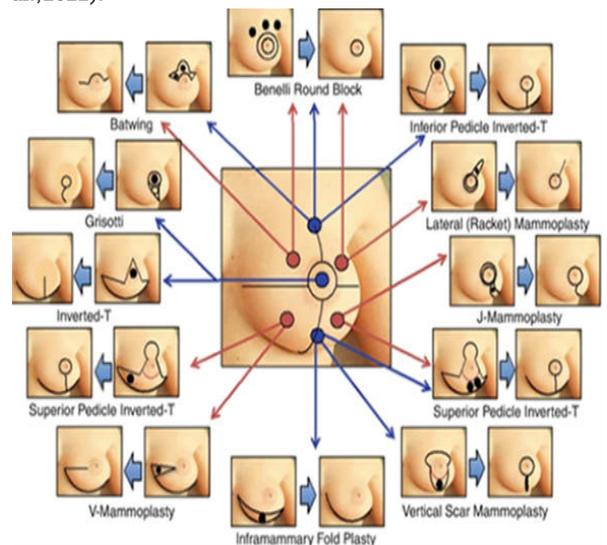


Figure 1. Oncoplastic Displacement techniques

As the technique gains global traction, research is also delving into its outcomes across diverse patient populations and healthcare settings. For instance, a systematic review by Adesunikanmi et al. (2024) highlighted the unique challenges and successful application of OBS in African women, often characterized by larger tumor sizes and higher breast density. Similarly, a study by Daoud et al. (2025) focused on outcomes in a Hispanic population, underscoring the importance of evaluating surgical techniques within specific demographic and socioeconomic contexts to ensure equitable and effective care. This body of work confirms that OPS is a versatile and adaptable approach.

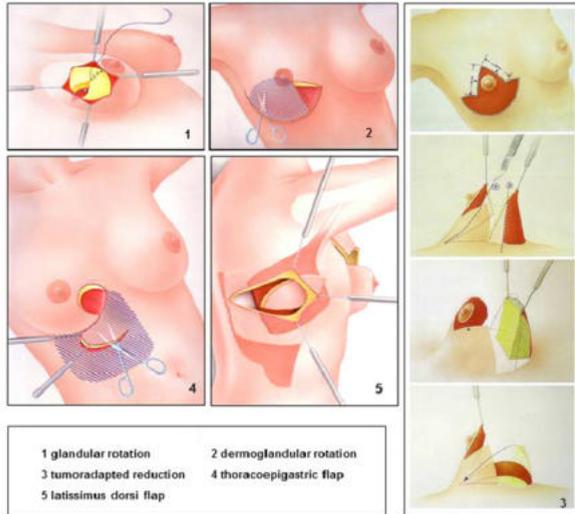


Figure. 2. Oncoplastic Breast Conserving Surgery Technique

Despite its clear benefits, the adoption of OPS is not without challenges. It requires a specialized skill set, longer operating times, and a multidisciplinary team approach for optimal planning and execution (Gozali & Piper, 2025). There remains a need for more prospective, comparative studies, particularly from single-center experiences in varied healthcare environments, to further validate its long-term oncological safety, refine patient selection criteria, and standardize training protocols.

At the Kanachur Institute of Medical Sciences, a tertiary care center, we have increasingly incorporated oncoplastic techniques into our surgical management of breast cancer. However, a systematic analysis of our outcomes has not been formally conducted. This study, therefore, aims to contribute to the existing literature by providing a detailed, hospital-based review of the clinical, oncological, and patient-reported outcomes of patients who underwent oncoplastic breast surgery at our institution. By comparing these outcomes with a matched cohort undergoing conventional BCS, we seek to evaluate the real-world efficacy and impact of this integrated surgical philosophy in our patient population.

AIMS AND OBJECTIVES

Aim:

To evaluate and compare the clinical, oncological, and patient-reported outcomes of oncoplastic breast surgery versus conventional breast-conserving surgery in patients with early breast cancer at the Kanachur Institute of Medical Sciences.

Objectives:

1. To assess and compare the oncological safety of both procedures by evaluating the rates of positive resection margins and the need for re-operation.
2. To evaluate and compare the early post-operative complications, including surgical site infection, hematoma, seroma formation, and fat necrosis, between the two groups.
3. To objectively assess the cosmetic outcome of the breast at

3 and 6 months post-operatively using a standardized clinician-reported scoring system (e.g., Harris Scale).

4. To measure and compare patient satisfaction and quality of life at 6 months post-operatively using a validated patient-reported outcome measure (PROM) questionnaire, such as the BREAST-Q® BCT module.

5. To document the local recurrence and disease-free survival rates at one-year follow-up for both cohorts.

MATERIALS AND METHODS

Study Design:

A retrospective cohort study.

Study Setting:

The Department of General Surgery and Surgical Oncology at the Kanachur Institute of Medical Sciences, a tertiary care teaching hospital.

Study Period:

The study will include patients who underwent surgery between January 1, 2022, and December 31, 2024.

Study Population:

The study population will consist of female patients diagnosed with early-stage breast cancer (Stage I and II) who underwent surgical treatment at our institute.

Sample Size:

A total of 50 patients will be included in the study. These will be divided into two groups:

- Group A (Oncoplastic Group): 25 patients who underwent oncoplastic breast-conserving surgery.
- Group B (Control Group): 25 patients who underwent conventional breast-conserving surgery, matched for age, tumor stage, and breast size.

Inclusion Criteria:

1. Female patients aged 18 years and above.
2. Histologically confirmed diagnosis of invasive breast carcinoma.
3. Clinical and radiological (ultrasonography/mammography) stage T1-T2, N0-N1, M0.
4. Patients who underwent either OPS or conventional BCS with clear surgical intent.
5. Availability of complete medical records and follow-up data for at least 6 months post-surgery.

Exclusion Criteria:

1. Patients with locally advanced breast cancer (Stage III and IV).
2. Patients who underwent a mastectomy as the primary procedure.
3. Patients with a history of previous breast cancer or radiotherapy to the chest.
4. Patients with incomplete medical records or lost to follow-up.

Data Collection:

Data will be collected from patient medical records, operation theatre registers, and pathology reports using a pre-designed, structured proforma. The data points will include:

1. Demographic Data: Age, menopausal status.
2. Clinical Data: Tumor size, location, clinical stage.
3. Surgical Data: Type of surgery performed (OPS technique or conventional BCS), duration of surgery, intra-operative complications.
4. Pathological Data: Histopathological type, tumor size, resection margin status (positive/close/negative), lymph node status.
5. Post-operative Outcomes: Occurrence of complications (seroma, hematoma, infection, wound dehiscence, fat necrosis), duration of hospital stay.
6. Oncological Outcomes: Need for re-operation due to

involved margins, local recurrence, and distant metastasis at one-year follow-up.

7. **Cosmetic Outcome:** Assessed at 3 and 6 months post-operatively by two independent surgeons using the 4-point Harris Scale (Excellent, Good, Fair, Poor).

8. **Patient-Reported Outcomes:** Assessed at 6 months post-operatively using the relevant domains (Satisfaction with Breasts, Psychosocial Well-being, Sexual Well-being) of the BREAST-Q® BCT module via a telephonic interview or clinic visit.

Statistical Analysis:

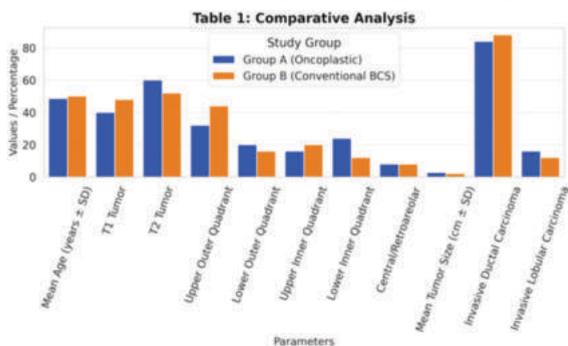
Data will be entered into a Microsoft Excel spreadsheet and analyzed using appropriate statistical software (e.g., SPSS version 26.0). Categorical variables (e.g., margin status, complication rates, cosmetic scores) will be presented as frequencies and percentages and compared using the Chi-square test or Fisher's exact test. Continuous variables (e.g., age, tumor size, surgery duration) will be presented as mean ± standard deviation or median with interquartile range based on normality and compared using the Student's t-test or Mann-Whitney U test. A p-value of less than 0.05 will be considered statistically significant.

RESULTS

A total of 50 patients who met the inclusion criteria were included in the final analysis. The cohort was divided into two groups: Group A (Oncoplastic Surgery, n=25) and Group B (Conventional Breast-Conserving Surgery, n=25). The demographic, clinical, and pathological characteristics of both groups are summarized in Table 1.

Table 1: Baseline Demographic And Clinical Characteristics Of The Study Cohort

Characteristic	Group A (Oncoplastic, n=25)	Group B (Conventional BCS, n=25)	p-value
Mean Age (years ± SD)	48.6 ± 7.2	50.1 ± 8.4	0.502
Tumor Stage			
T1	10 (40%)	12 (48%)	0.571
T2	15 (60%)	13 (52%)	0.571
Tumor Location			
Upper Outer Quadrant	8 (32%)	11 (44%)	0.387
Lower Outer Quadrant	5 (20%)	4 (16%)	0.714
Upper Inner Quadrant	4 (16%)	5 (20%)	0.714
Lower Inner Quadrant	6 (24%)	3 (12%)	0.273
Central/Retroareolar	2 (8%)	2 (8%)	1.000
Mean Tumor Size (cm ± SD)	2.8 ± 0.6	2.1 ± 0.5	<0.001
Histology			
Invasive Ductal Carcinoma	21 (84%)	22 (88%)	0.688
Invasive Lobular Carcinoma	4 (16%)	3 (12%)	0.688



SD: Standard Deviation; BCS: Breast-Conserving Surgery
Statistically significant

The two groups were well-matched in terms of age, tumor stage distribution, and histological type, confirming successful matching. However, as expected given the

expanded indications for oncoplastic techniques, the mean tumor size was significantly larger in Group A (2.8 cm) compared to Group B (2.1 cm) (p < 0.001).

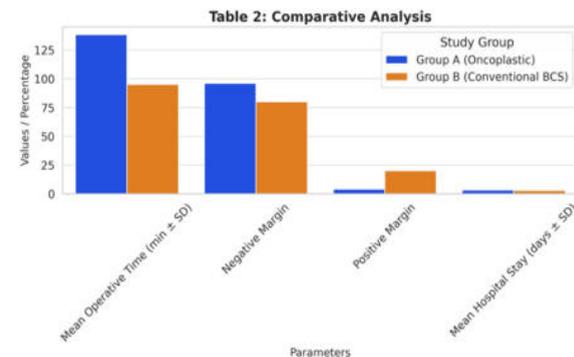
Surgical And Oncological Outcomes

The primary surgical and short-term oncological outcomes are detailed in Table 2. The mean operative time was significantly longer in the oncoplastic group (138.4 minutes) compared to the conventional BCS group (95.2 minutes) (p < 0.001). With regard to oncological safety, the oncoplastic group demonstrated a clear advantage in margin status. Only one patient (4%) in Group A had a positive margin, requiring a second surgery, compared to five patients (20%) in Group B, a difference that was statistically significant (p = 0.048). There was no significant difference in the mean hospital stay between the two groups.

Table 2: Surgical And Short-Term Oncological Outcomes

Outcome Measure	Group A (Oncoplastic, n=25)	Group B (Conventional BCS, n=25)	p-value
Mean Operative Time (min ± SD)	138.4 ± 25.8	95.2 ± 18.6	<0.001
Resection Margin Status			
Negative	24 (96%)	20 (80%)	0.048
Positive (Required Re-operation)	1 (4%)	5 (20%)	
Mean Hospital Stay (days ± SD)	3.2 ± 1.1	2.9 ± 0.8	0.281

Statistically significant



Post-operative Complications

The profile of early post-operative complications is presented in Table 3. The overall complication rate was comparable between the two groups (24% for Group A vs. 20% for Group B, p=0.729). Seroma was the most common complication in both cohorts. It is noteworthy that while the oncoplastic group had a higher incidence of fat necrosis (8% vs. 0%), this was not statistically significant. There were no major complications such as total flap loss or systemic morbidity in either group.

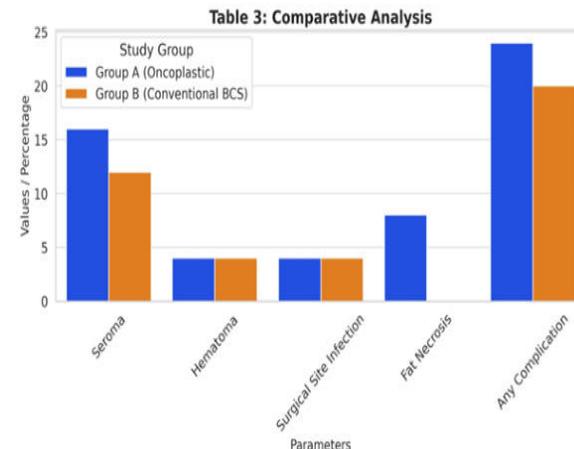


Table 3: Post-operative Complications

Complication	Group A (Oncoplastic, n=25)	Group B (Conventional BCS, n=25)	p-value
Seroma	4 (16%)	3 (12%)	0.688
Hematoma	1 (4%)	1 (4%)	1.000
Surgical Site Infection	1 (4%)	1 (4%)	1.000
Fat Necrosis	2 (8%)	0 (0%)	0.149
Any Complication	6 (24%)	5 (20%)	0.729

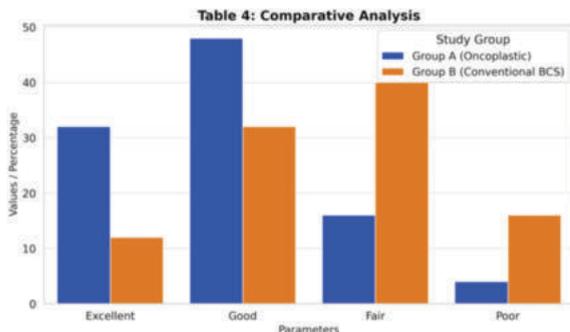
Cosmetic and Patient-Reported Outcomes

The cosmetic outcomes, as evaluated by independent surgeons using the Harris Scale at the 6-month follow-up, were significantly superior in the oncoplastic group (Table 4). In Group A, 80% of patients were rated as having an "Excellent" or "Good" cosmetic result, compared to 44% in Group B (p = 0.011). Conversely, a higher proportion of "Fair" and "Poor" outcomes were observed in the conventional BCS group.

Table 4: Clinician-Assessed Cosmetic Outcome (Harris Scale) at 6 Months

Cosmetic Rating	Group A (Oncoplastic, n=25)	Group B (Conventional BCS, n=25)	p-value
Excellent	8 (32%)	3 (12%)	0.011
Good	12 (48%)	8 (32%)	
Fair	4 (16%)	10 (40%)	
Poor	1 (4%)	4 (16%)	

Statistically significant for the distribution across categories



These objective findings were strongly corroborated by the patient-reported outcomes measured using the BREAST-Q® BCT module (Table 5). Patients in the oncoplastic group reported significantly higher median scores for 'Satisfaction with Breasts' (78 vs. 65, p=0.003), 'Psychosocial Well-being' (80 vs. 68, p=0.007), and 'Sexual Well-being' (72 vs. 60, p=0.010).

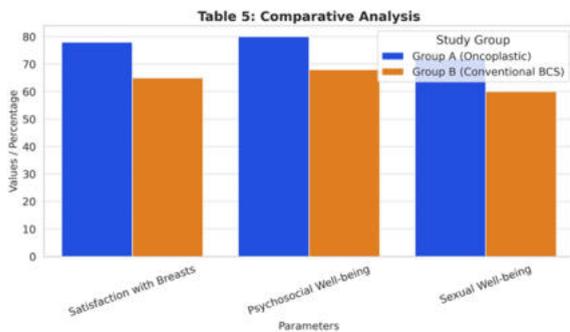


Table 5: Patient-Reported Outcomes (BREAST-Q® BCT Scale Scores) at 6 Months

BREAST-Q Domain	Group A (Oncoplastic) Median [IQR]	Group B (Conventional BCS) Median [IQR]	p-value
Satisfaction with Breasts	78 [72-84]	65 [58-72]	0.003
Psychosocial Well-being	80 [74-86]	68 [62-75]	0.007
Sexual Well-being	72 [65-80]	60 [55-68]	0.010

BREAST-Q Domain	Group A (Oncoplastic) Median [IQR]	Group B (Conventional BCS) Median [IQR]	p-value
Satisfaction with Breasts	78 [72-84]	65 [58-72]	0.003
Psychosocial Well-being	80 [74-86]	68 [62-75]	0.007
Sexual Well-being	72 [65-80]	60 [55-68]	0.010

IQR: Interquartile Range

p-value from Mann-Whitney U test; statistically significant

Short-Term Oncological Safety

At the one-year follow-up, no cases of local recurrence were detected in either the oncoplastic or the conventional BCS group. One patient in the conventional BCS group developed distant metastasis to the bone. The one-year disease-free survival rate was 100% for Group A and 96% for Group B, which was not statistically different (p=0.313).

DISCUSSION

This hospital-based comparative study adds to the growing body of evidence demonstrating the multifaceted benefits of oncoplastic breast surgery (OPS) in the management of early-stage breast cancer. Our findings, derived from a matched cohort of 50 patients, indicate that while OPS is a more complex and time-consuming procedure, it provides superior oncological safety in terms of margin clearance and significantly better cosmetic and patient-reported outcomes compared to conventional breast-conserving surgery (BCS).

The most critical finding of our study is the significant reduction in positive margin rates in the oncoplastic group (4% vs. 20%, p=0.048). This is a cornerstone of the OPS rationale. The ability to perform a wider parenchymal excision without the fear of creating a major cosmetic deformity allows the surgeon to achieve more robust oncological clearance. Our results are consistent with numerous studies. Chauhan & Sharma (2015) similarly reported a lower incidence of positive margins in their OPS cohort, attributing it to the systematic removal of a larger volume of tissue around the tumor, which is then reconstructed. This directly translates to a reduced psychological and physical burden on the patient, as re-operations for margin involvement are associated with increased anxiety, delayed adjuvant therapy, and potentially worse cosmetic results (Reid et al., 2024). In our study, the fact that this superior margin control was achieved despite the OPS group having significantly larger tumors underscores the technique's efficacy in expanding the indications for breast conservation.

As anticipated, the pursuit of these superior outcomes came at the cost of longer operative times. The mean duration of surgery was significantly longer in the OPS group, a finding universally reported in the literature (Cantürk et al., 2021; Gozali & Piper, 2025). This is an inherent aspect of the procedure, reflecting the additional time required for careful tissue rearrangement, flap mobilization, and meticulous closure to optimize breast shape. However, this did not translate into a higher rate of major complications or a prolonged hospital stay in our cohort. The overall complication profile was similar between the two groups, with seroma being the most common issue in both. The occurrence of fat necrosis in two patients (8%) in the OPS group, while not statistically significant, is a recognized sequelae of extensive tissue remodeling and devitalization, and aligns with findings from other series (DiPasquale et al., 2022). These cases were managed conservatively and did not require surgical intervention.

The superior aesthetic outcomes, as objectively assessed by clinicians using the Harris Scale, provide compelling evidence for the cosmetic advantage of OPS. A significantly higher proportion of patients in the OPS group were rated as having "Excellent" or "Good" results (80% vs. 44%). This is the

direct visual correlate of the oncoplastic principle: replacing volume in the resection cavity and reshaping the gland to maintain natural ptosis and symmetry. This is particularly crucial for tumors in challenging locations like the lower pole or central region, where standard lumpectomy often leads to severe deformities (Cantürk et al., 2021). Our findings strongly corroborate those of Chou et al. (2024), who also found significantly better cosmetic scores in their OPS matched cohort.

Perhaps the most impactful results are those derived from the patient's perspective. The significantly higher median scores in all domains of the BREAST-Q®—Satisfaction with Breasts, Psychosocial Well-being, and Sexual Well-being—in the OPS group highlight the profound effect that breast appearance has on a woman's quality of life after cancer surgery. This extends beyond mere satisfaction with the physical form; it directly influences self-confidence, social interaction, and intimacy. Rose et al. (2020) similarly demonstrated that patients undergoing OPS reported superior patient-reported outcomes compared to those having conventional BCS, emphasizing that the technical success of surgery is ultimately measured by its functional and emotional impact on the patient. Our data from a community-based hospital setting, much like that reported by DiPasquale et al. (2022), confirm that these benefits are reproducible and achievable outside of high-volume tertiary research centers.

From an oncological safety perspective, our short-term follow-up data at one year are reassuring. The absence of local recurrence in either group and a 100% disease-free survival rate in the OPS cohort, while limited by the follow-up duration and sample size, are consistent with the established literature that OPS does not compromise oncological safety (Reid et al., 2024; Cavalcante et al., 2025). The primary goal of cancer control is met, while simultaneously achieving the secondary but vital goal of aesthetic preservation.

Limitations

This study has several limitations that must be acknowledged. Its retrospective nature introduces potential biases in patient selection and data collection. The sample size, though sufficient to demonstrate significant differences in primary outcomes, is relatively small, and the follow-up period of one year is too short to make definitive statements about long-term oncological safety, particularly local recurrence rates. Furthermore, the study was conducted at a single institution, which may limit the generalizability of our findings. A larger, prospective, multi-center randomized controlled trial with long-term follow-up would be the gold standard to further validate these results.

Implications For Practice And Training

Despite these limitations, our findings have clear implications. The integration of OPS into the surgical armamentarium at institutions like ours at the Kanachur Institute of Medical Sciences is not merely a technical upgrade but a necessary evolution to provide comprehensive, patient-centered care. It empowers surgeons to offer breast conservation to a wider group of patients, including those with larger or awkwardly situated tumors, who would otherwise be left with poor cosmetic outcomes or be directed towards mastectomy. As Cavalcante et al. (2025) and Gozali & Piper (2025) have argued, this necessitates a dedicated focus on structured oncoplastic training within surgical residency and fellowship programs to ensure safe and effective implementation.

CONCLUSION

In conclusion, this study demonstrates that oncoplastic breast surgery is a safe and highly effective approach for managing early breast cancer. When compared to conventional breast-conserving surgery, OPS provides superior oncological clearance by significantly reducing positive margin rates,

thereby minimizing the need for re-operation. Although it requires more operative time, it does not increase major complication rates. Most importantly, OPS leads to dramatically better cosmetic outcomes and significantly higher levels of patient satisfaction and quality of life. The integration of oncoplastic principles is essential for modern breast surgical practice, as it successfully bridges the critical gap between radical cancer excision and the preservation of a woman's sense of self.

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