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# Grisotti versus Wise-Pattern Oncoplastic Reconstruction in Central Breast Cancer: A Randomized Controlled Study

Ismail Ahmed Shafik[1], Sherif Mohamed Mokhtar[1], Kerolos A. Barsoum[1], Abdelrahman Lotfy[1], Abdelrahman M. Mohamed[1], Muhammed Hussein Khalifa[1], Ahmed Shafik Jr.[2], Mahmoud Ali Abdel-Mohsen[1]

[1]Department of General Surgery, Cairo University Faculty of Medicine, Cairo, Egypt
[2]Department of Surgery, New Giza University (NGU), Cairo, Egypt

## ABSTRACT

**Objective:** Central breast tumors requiring excision of the nipple-areola complex present a reconstructive challenge in breast-conserving surgery. Volume-displacement oncoplastic techniques, including the Grisotti flap and reduction-based Wise-pattern reconstruction, allow breast preservation while maintaining oncological safety. This study compares the short-term oncological and aesthetic outcomes of these two techniques.

**Materials and Methods:** A randomized controlled trial was conducted, enrolling 40 patients with centrally located breast cancer who underwent breast-conserving surgery between March 2023 and November 2024. Patients were randomized to reconstruction using either the Grisotti technique ($n$ = 20) or the Wise-pattern technique ($n$ = 20). The primary outcome was surgical margin status. Secondary outcomes included postoperative complications and aesthetic satisfaction. The mean follow-up duration was 6.9 months.

**Results:** Mean tumor size was 3.2±1.5 cm in the Grisotti group and 2.6±0.8 cm in the Wise-pattern group ($p$ = 0.327). The mean tumor-to-nipple-areola complex distance was 2.17±1.01 cm in the Grisotti group and 2.90±1.04 cm in the Wise-pattern group ($p$ = 0.428). Negative surgical margins were achieved in 90% and 100% of cases, respectively ($p$ = 0.487), with re-excision required in two Grisotti cases. Postoperative complications did not differ significantly between groups; seroma was the most frequent complication (25% *vs.* 20%, $p$ = 1.0). Patient satisfaction was rated as good or excellent in 85% of Grisotti cases and 90% of Wise-pattern cases ($p$ = 0.549). Mean surgeon satisfaction scores were 7.55±1.39 and 8.10±0.72, respectively ($p$ = 0.128). No cases of flap necrosis were observed.

**Conclusion:** Both the Grisotti and Wise-pattern techniques demonstrated comparable short-term oncological safety and satisfactory aesthetic outcomes in breast-conserving surgery for central breast tumors. Differences in patient and surgeon satisfaction did not reach statistical significance. The Grisotti technique is most suitable for patients with small-to-moderate breast volumes and mild-to-moderate ptosis, while the Wise-pattern technique offers advantages in macromastia, significant ptosis, or when contralateral symmetrisation is planned. These findings support individualized technique selection based on breast volume and anatomical considerations, while highlighting the need for larger studies with longer follow-up to assess long-term oncological and aesthetic outcomes, and prospective use of validated aesthetic outcome instruments.

**Keywords:** Oncoplastic breast surgery; breast-conserving surgery; central breast cancer; nipple-areola complex excision; Grisotti flap; Wise-pattern oncoplastic reconstruction; aesthetic outcomes; surgical margins

**Corresponding Author:** Ahmed Shafik Jr., MD;
**E-mail:** shafikahmed@me.com; ahmed.shafik@ngu.edu.eg **ORCID:** orcid.org/0009-0002-8035-066X

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**KEY POINTS**

- This randomized study compares the Grisotti flap and Wise-pattern therapeutic mammoplasty for centrally located breast cancer.
- Both techniques demonstrated comparable short-term oncologic safety and acceptable aesthetic outcomes.
- Margin status, complication rates, and patient satisfaction did not differ significantly between groups.
- Technique selection may be guided by anatomical considerations and surgeon expertise.

## Introduction

Breast-conserving surgery (BCS) is a cornerstone of contemporary breast cancer management, offering oncological outcomes equivalent to those of mastectomy while preserving breast form and patients' quality of life. Landmark randomised trials have established that BCS with radiotherapy achieves long-term survival and local control equivalent to mastectomy in eligible patients (1, 2). Over the past two decades, the integration of reconstructive techniques into breast-conserving procedures has led to the development of oncoplastic BCS (OPBCS), which combines oncologic resection with volume displacement or volume replacement techniques to optimize aesthetic outcomes without compromising oncological safety (3). International consensus statements and practice guidelines now recognize OPBCS as a standard component of breast cancer surgery when performed in accordance with established oncologic principles (4-6).

Multiple observational studies and pooled analyses have demonstrated that OPBCS achieves rates of negative margins, local recurrence, and survival comparable to conventional BCS, despite being applied to patients with larger tumors or less favorable tumor-to-breast ratios (5-7). Importantly, available evidence suggests that OPBCS does not increase the risk of postoperative complications or delay adjuvant therapy when appropriately planned and executed, supporting its oncological safety in routine clinical practice (5-7).

Centrally located breast cancers, particularly those requiring excision of the nipple-areola complex (NAC), represent a distinct reconstructive challenge in BCS. Although tumor location alone is no longer considered a contraindication to breast conservation, resection of the NAC can result in significant central breast deformity if reconstruction is inadequate. Contemporary oncoplastic approaches have therefore focused on restoring breast shape and symmetry following central excision, allowing breast conservation in selected patients who might otherwise undergo mastectomy (8, 9).

Among the volume-displacement techniques described for centrally located tumors, the Grisotti flap is a well-established approach that enables immediate reconstruction of the central defect using local glandular tissue. Favorable oncological and aesthetic outcomes have been reported with this technique, particularly in patients with small-to-moderate breast volumes and mild to moderate ptosis (8-10). However, several studies have highlighted limitations of the classical Grisotti technique in patients with large or markedly ptotic breasts, short nipple–inframammary fold distances, or unfavorable breast morphology, prompting the development of technical modifications and alternative oncoplastic strategies (8, 11).

Therapeutic reduction mammoplasty and mastopexy-based techniques, commonly employing a Wise-pattern skin incision, represent established level II volume-displacement oncoplastic procedures. These techniques allow wider resections, improved reshaping of the breast mound, and contralateral symmetrization in appropriately selected patients, particularly those with larger breast volumes or significant ptosis (5, 6, 8). Current guidelines emphasize that selection of oncoplastic technique should be individualized, taking into account breast size, degree of ptosis, tumor characteristics, and patient preferences, rather than adhering to a single reconstructive approach (4-6).

Despite the widespread adoption of both the Grisotti technique and reduction-based oncoplastic approaches, existing evidence directly comparing specific oncoplastic techniques remains limited. Most available comparative studies remain retrospective or descriptive in nature, and comparative data are often confounded by heterogeneity in patient selection, tumor characteristics, and outcome assessment (4, 7, 12). In addition, while patient-reported outcomes and aesthetic satisfaction are increasingly recognized as essential endpoints in oncoplastic surgery, few studies have incorporated both surgeon-reported and patient-reported assessments within a comparative framework (6, 12).

This randomized controlled trial was designed to compare the short-term oncological and aesthetic outcomes of the Grisotti technique and Wise-pattern oncoplastic reconstruction in patients undergoing BCS for centrally located breast cancer. By directly comparing two commonly used volume-displacement techniques within a randomized design, this study aims to contribute higher-level evidence to inform technique selection and to optimize individualized surgical planning for this challenging patient population.

## Materials and Methods

### Study Design

This prospective randomized controlled trial was conducted at Kasr Al-Ainy Teaching Hospitals, Faculty of Medicine, Cairo University between March 2023 and November 2024. The study included 40 patients diagnosed with centrally located breast cancer who underwent BCS. Patients were randomized into two equal groups: Group A (Grisotti technique, $n = 20$) and Group B (Wise-pattern technique, $n = 20$).

### Ethics Approval and Trial Registration

The study protocol was approved by the Research Ethics Committee of the Faculty of Medicine, Cairo University (approval code: MD-266-2023, approved on 10 September 2023), prior to patient enrollment. The study design, eligibility criteria, and primary and secondary outcomes were prospectively defined before recruitment commenced in March 2023. The trial was retrospectively registered with the ISRCTN registry (ISRCTN16836500) on 20 May 2025; prospective registration was not mandated by the institutional ethics committee at the time of study initiation. All procedures were conducted in accordance with the Declaration of Helsinki and relevant national regulations. Written informed consent was obtained from all participants prior to enrollment.

The study was conducted in accordance with the pre-approved protocol throughout; no amendments to the study design, eligibility criteria, or outcome definitions were made after patient enrollment commenced.

### Inclusion and Exclusion Criteria

#### Inclusion Criteria

- Patients with early-stage, centrally located breast cancer (cT1–2) suitable for BCS.
- Centrally located breast cancer cases downgraded to cT1–2 following neoadjuvant therapy.

#### Exclusion Criteria

- Breast cancer not centrally located.
- Inflammatory breast cancer (cT4d).
- Metastatic or multicentric breast cancer.
- Patients with small breast size (cup size C or smaller).

### Preoperative Assessment

All patients underwent comprehensive preoperative evaluation, including:

- Detailed medical history, including family history, prior breast irradiation, and symptoms suggestive of metastatic disease.
- Complete clinical examination of the breasts and axillae.
- Bilateral sonomammography.
- Histopathological confirmation via ultrasound-guided core needle biopsy.
- Breast magnetic resonance imaging (MRI) to evaluate NAC involvement.
- Routine laboratory investigations and metastatic workup.

All cases were discussed in a multidisciplinary setting prior to surgical intervention.

The decision to excise the NAC was based on a multidisciplinary assessment and was not determined by tumor-to-NAC distance alone. Indications included clinical nipple involvement (retraction or ulceration), MRI-documented subareolar extension, and pathological subtypes associated with increased risk of NAC involvement, such as Paget disease and centrally located invasive carcinoma with subareolar ductal spread.

### Molecular Classification and Receptor Status

All tumors were analyzed for hormone receptor and HER2 status via immunohistochemistry. Estrogen receptor (ER) and progesterone receptor (PR) positivity were defined as ≥1% of tumor cell nuclei with nuclear staining. HER2 status was determined by immunohistochemistry (0, 1+, 2+, 3+) and confirmed by fluorescence in situ hybridization (FISH) when IHC was 2+. Tumors were classified into five molecular subtypes based on receptor status and Ki-67 proliferation index: Luminal A (ER+ and/or PR+, HER2-, Ki-67 <14%), Luminal B1 (ER+ and/or PR+, HER2-, Ki-67 ≥14%), Luminal B2 (ER+ and/or PR+, HER2+, any Ki-67), HER2-enriched (ER-, PR-, HER2+), and triple-negative breast cancer (ER-, PR-, HER2-). Classification was performed according to American Society of Clinical Oncology and College of American Pathologists guidelines (13).

### Randomization

Eligible patients were randomized 1:1 to the Grisotti technique group or the Wise-pattern technique group. Randomization was performed using a computer-generated randomization sequence. Due to the nature of the surgical interventions, blinding of the operating surgeons was not feasible.

### Surgical Techniques

#### Grisotti Technique

Preoperatively, the NAC was marked for circular excision. Following central lumpectomy with removal of the NAC,

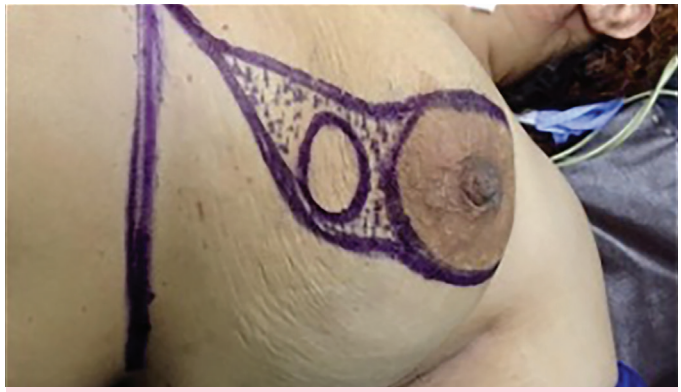

**Figure 1.** Circular excision of the nipple-areola complex is outlined, with inferiorly based dermoglandular flap design and planned skin island for neo-areola reconstruction

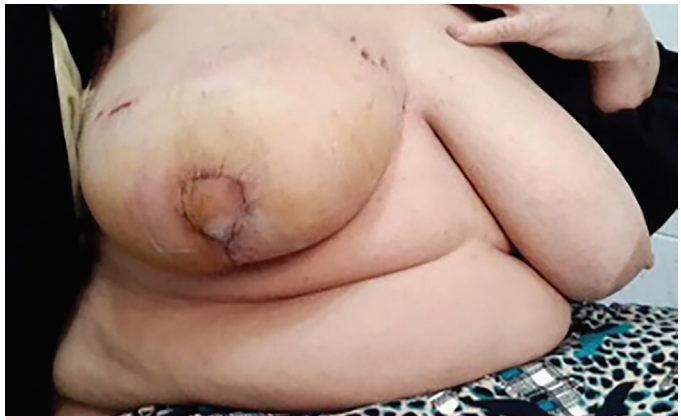

**Figure 2.** Postoperative appearance demonstrating central defect reconstruction with advancement of the dermoglandular flap and formation of the neo-areola

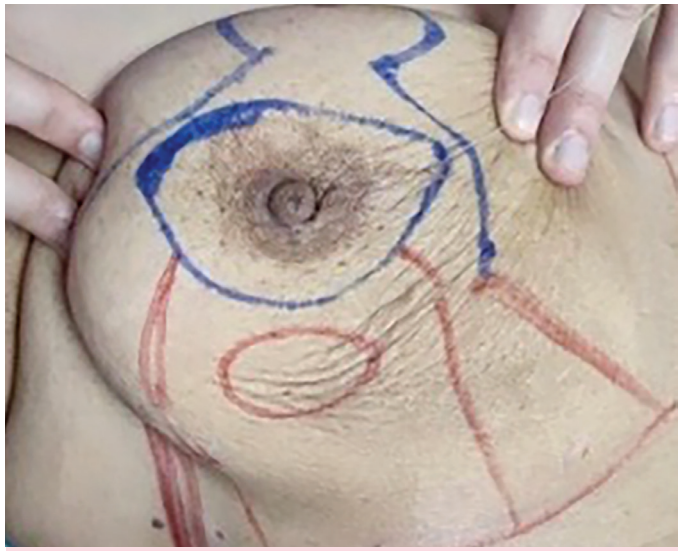

**Figure 3.** Standard Wise-pattern skin markings outlining central excision and planned reduction-based parenchymal reshaping

reconstruction was performed using a dermoglandular flap incorporating a skin island to recreate the neo-NAC. The flap was mobilized and advanced into the central defect, and glandular reshaping was performed to restore breast contour (Figures 1 and 2).

### Wise-Pattern Technique

In the Wise-pattern group, reconstruction was performed using a therapeutic mammoplasty approach. After central tumor excision with NAC removal, a Wise-pattern incision was used to permit adequate tumor resection and parenchymal reshaping. Glandular redistribution was performed to restore breast contour and symmetry. Contralateral symmetrization was performed when indicated (Figures 3 and 4).

All procedures adhered to oncological principles with the goal of achieving clear surgical margins.

### Outcome Measures

Primary outcomes included:

- Surgical margin status.
- Postoperative complications.
- Aesthetic satisfaction.

Margin status was determined from the final histopathological examination. Postoperative complications included seroma formation and wound infection.

Aesthetic outcomes were assessed using both patient-reported satisfaction (categorized as excellent/good versus fair/poor) and surgeon-reported visual analog scale (VAS) scoring. A surgeon-reported VAS (0–10) was selected as a complementary continuous measure of overall aesthetic outcome alongside the categorical patient satisfaction scale. We acknowledge that validated instruments, such as the Harvard Breast Cosmesis Scale and the BREAST-Q, would have provided a more standardised assessment; their absence is recognised as a limitation of the current study. VAS was selected for its simplicity and feasibility in routine clinical practice.

### Follow-up

Patients were followed postoperatively according to institutional protocols. The mean follow-up duration was 6.9 months. Follow-up duration was reported as the mean because individual patient-level data required to calculate the median and range were unavailable. Clinical assessment included evaluation of wound healing, postoperative complications, and early oncological outcomes. No patients were lost to follow-up.

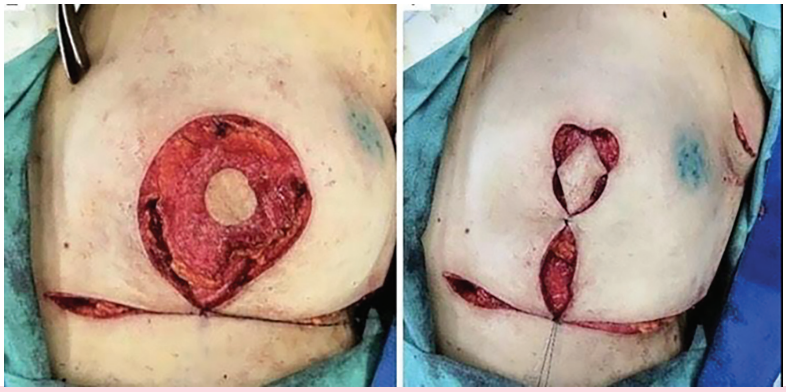

**Figure 4.** Intraoperative view demonstrating parenchymal redistribution and closure using the Wise-pattern technique after nipple-areola complex excision

### Statistical Analysis

Statistical analysis was performed using SPSS version 28 (IBM Corp., Armonk, NY, USA). Continuous variables were expressed as mean ± standard deviation. Normality of data distribution was assessed using the Shapiro-Wilk test. Tumor diameter and NAC distance were non-normally distributed and were therefore analyzed using the Mann-Whitney U test; normally distributed variables were compared using independent-samples t-tests. Categorical variables were analyzed using chi-square or Fisher's exact tests where appropriate. A $p$-value <0.05 was considered statistically significant.

## Results

### Patient Characteristics

Forty patients were randomized into two equal groups: the Grisotti group ($n$ = 20) and the Wise-pattern group ($n$ = 20).

The mean age was 52.95±9.79 years in the Grisotti group and 54.90±6.50 years in the Wise-pattern group ($p$ = 0.463) (Table 1). Marital status ($p$ = 0.438), medical comorbidities ($p$ = 0.739), and family history ($p$ = 0.661) were comparable between groups (Table 2).

Tumor characteristics were similar between groups. The mean largest tumor diameter was 3.21±1.48 cm in the Grisotti group and 2.60±0.82 cm in the Wise-pattern group ($p$ = 0.327, Mann-Whitney U test). The mean distance from the NAC was 2.17±1.01 cm in the Grisotti group and 2.90±1.04 cm in the Wise-pattern group ($p$ = 0.428, Mann-Whitney U test) (Table 3). One patient in the Grisotti group had an initial tumor diameter of 6.8 cm (clinical T3); this patient received neoadjuvant chemotherapy, resulting in downstaging to ypT2 prior to enrollment, consistent with the study's inclusion criteria.

The distribution of pathological types showed no significant differences between groups ($p$ = 0.220). Invasive ductal carcinoma was the most common subtype in both groups (70% in the Grisotti group *vs.* 80% in the Wise-pattern group). Hormonal receptor subtypes were similarly distributed ($p$ = 0.829) (Table 4). All randomized patients were included in the final analysis.

### Treatment Characteristics

Neoadjuvant chemotherapy was administered more frequently in the Wise-pattern group (70%) than in the Grisotti group (25%) ($p$ = 0.004). Regarding axillary management, sentinel lymph node biopsy was performed in 70% of Grisotti patients and 40% of Wise-pattern patients, whereas axillary lymph node dissection was required in 30% of Grisotti patients and 60% of Wise-pattern patients ($p$ = 0.057) (Table 5).

Among the 19 patients who received neoadjuvant chemotherapy (5 in the Grisotti group, 14 in the Wise-pattern group), invasive ductal carcinoma was the predominant histological subtype. Pre-treatment tumor sizes in the Grisotti NCT subgroup ranged from 1.9 to 6.8 cm, and molecular subtypes included Luminal B1, Luminal A, HER2-enriched, and Luminal AB1. One patient in this subgroup was downstaged from cT3 to ypT2 following treatment.

**Table 1. Age distribution of participants**

| | Grisotti | | | | | Wise pattern | | | | | *p*-value |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD (±) | Median | Min. | Max. | Mean | SD (±) | Median | Min. | Max. | |
| **Age** | 52.95 | 9.79 | 51.00 | 37.00 | 74.00 | 54.90 | 6.50 | 54.50 | 43.00 | 66.00 | 0.463 |

SD: Standard deviation; Min.: Minimum; Max: Maximum

**Table 2. Demographic data**

| Count | | Grisotti | | Wise pattern | | *p*-value |
|---|---|---|---|---|---|---|
| | | % | Count | % | | |
| Marital status | Married | 16 | 80.0% | 12 | 60.0% | 0.438 |
| | Widow | 3 | 15.0% | 6 | 30.0% | |
| | Divorced | 1 | 5.0% | 2 | 10.0% | |
| Medical condition | Cardiac | 1 | 5.0% | 2 | 10.0% | 0.739 |
| | CKD | 1 | 5.0% | 0 | 0.0% | |
| | DM | 2 | 10.0% | 0 | 0.0% | |
| | HTN | 3 | 15.0% | 4 | 20.0% | |
| | HTN, DM | 3 | 15.0% | 2 | 10.0% | |
| | Free | 10 | 50.0% | 12 | 60.0% | |
| Family history | Positive | 2 | 10.0% | 4 | 20.0% | 0.661 |
| | Negative | 18 | 90.0% | 16 | 80.0% | |

CKD: Chronic kidney disease; DM: Diabetes mellitus; HTN: Hypertension

**Table 3. Tumor characteristics: diameter and distance from nipple-areola complex (NAC)**

| | Grisotti | | | | | Wise pattern | | | | | *p*-value |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | Median | Min. | Max. | Mean | SD | Median | Min. | Max. | |
| Largest diameter of the tumor | 3.21 | 1.48 | 2.80 | 1.40 | 6.80* | 2.60 | 0.82 | 2.75 | 1.50 | 4.00 | 0.327 |
| Distance from the NAC (cm) | 2.17 | 1.01 | 2.15 | 0.50 | 4.00 | 2.90 | 1.04 | 2.20 | 0.00 | 3.5 | 0.428 |

*: This value represents a patient who was initially clinical T3 and was downstaged to ypT2 following neoadjuvant chemotherapy prior to surgical enrollment, in accordance with the study's inclusion criteria. *P*-values: tumor diameter $p = 0.327$; NAC distance $p = 0.428$ (Mann-Whitney U test). SD: Standard deviation; Min.: Minimum; Max.: Maximum

**Table 4. Histopathological and immunohistochemical characteristics of tumor**

| Count | | Grisotti | | Wise pattern | | *p*-value |
|---|---|---|---|---|---|---|
| | | % | Count | % | | |
| Pathological type | Paget | 2 | 10.0% | 4 | 20.0% | 0.220 |
| | ILC | 3 | 15.0% | 0 | 0.0% | |
| | IDC | 14 | 70.0% | 16 | 80.0% | |
| | DCIS | 1 | 5.0% | 0 | 0.0% | |
| Clinical involvement of the nipple | Ulceration | 2 | 10.0% | 4 | 20.0% | 0.458 |
| | Retraction | 7 | 35.0% | 4 | 20.0% | |
| | No clinical involvement | 11 | 55.0% | 12 | 60.0% | |
| Hormonal status | HER2 enriched | 2 | 10.0% | 2 | 10.0% | 0.829 |
| | Luminal A | 9 | 45.0% | 6 | 30.0% | |
| | Luminal B1 | 5 | 25.0% | 8 | 40.0% | |
| | Luminal B2 | 1 | 5.0% | 2 | 10.0% | |
| | Luminal AB1 | 1 | 5.0% | 0 | 0.0% | |
| | Triple negative | 2 | 10.0% | 2 | 10.0% | |

Molecular subtypes were determined based on immunohistochemistry (IHC) for estrogen receptor (ER), progesterone receptor (PR), and human epidermal growth factor receptor 2 (HER2), and Ki-67 proliferation index, classified as follows: Luminal A (ER+ and/or PR+, HER2-, Ki-67 <14%), Luminal B1 (ER+ and/or PR+, HER2-, Ki-67 ≥14%), Luminal B2 (ER+ and/or PR+, HER2+, any Ki-67), HER2-enriched (ER-, PR-, HER2+), and Triple-negative (ER-, PR-, HER2-) (13). ER status was considered positive if ≥1% of tumor cell nuclei stained positive; PR and HER2 were scored according to American Society of Clinical Oncology/College of American Pathologists guidelines. ILC:

ILC: Invasive lobular carcinoma; IDC: Invasive ductal carcinoma; DCIS: Ductal carcinoma *in situ*

In the Wise-pattern NCT subgroup, pre-treatment tumor sizes ranged from 1.5 to 4.0 cm, with Luminal B1 being the most frequent subtype, followed by triple-negative, HER2-enriched, and Luminal B2. The higher proportion of NCT recipients and higher rate of axillary lymph node dissection in the Wise-pattern group suggest a greater initial tumor burden at presentation, which may have influenced surgical planning and technique selection.

### Surgical Outcomes

Negative margins were achieved in 90% of patients in the Grisotti group and 100% in the Wise-pattern group ($p = 0.487$). Two patients in the Grisotti group required re-excision because of positive margins on initial surgery; clear margins were subsequently obtained.

### Postoperative Complications

Postoperative complications did not differ significantly between groups. Seroma occurred in 25% of patients in the Grisotti group and in 20% of patients in the Wise-pattern group ($p = 1.0$). Wound infection was reported in 10% of Grisotti patients and in none of the Wise-pattern patients ($p = 0.487$). Wound dehiscence occurred in 5% of Grisotti patients and was not observed in the Wise-pattern group ($p = 1.0$). No cases of flap necrosis were observed in either group (Table 6).

### Aesthetic Outcomes

Patient-reported satisfaction did not differ significantly between groups ($p = 0.549$). In the Grisotti group, outcomes were rated

**Table 5. Surgical approach and procedure details**

| Count | | Grisotti | | Wise pattern | | *p*-value |
|---|---|---|---|---|---|---|
| | | % | Count | % | | |
| **Neoadjuvant therapy** | Yes | 5 | 25.0% | 14 | 70.0% | 0.004 |
| | No | 15 | 75.0% | 6 | 30.0% | |
| **Surgery to axilla** | SLNB | 14 | 70.0% | 8 | 40.0% | 0.057 |
| | ALND | 6 | 30.0% | 12 | 60.0% | |
| **Margin status** | Infiltrated | 2 | 10.0% | 0 | 0.0% | 0.487 |
| | Free | 18 | 90.0% | 20 | 100.0% | |

SLNB: Sentinel lymph node biopsy; ALND: Axillary lymph node dissection

**Table 6. Postoperative complications and their incidence**

| Count | | Grisotti | | Wise pattern | | *p*-value |
|---|---|---|---|---|---|---|
| | | % | Count | % | | |
| **Seroma** | Yes | 5 | 25.0% | 4 | 20.0% | 1.000 |
| | No | 15 | 75.0% | 16 | 80.0% | |
| **Wound infection** | Yes | 2 | 10.0% | 0 | 0.0% | 0.487 |
| | No | 18 | 90.0% | 20 | 100.0% | |
| **Flap necrosis** | No | 20 | 100.0% | 20 | 100.0% | N/A |
| **Wound dehiscence** | Yes | 1 | 5.0% | 0 | 0.0% | 1.000 |
| | No | 19 | 95.0% | 20 | 100.0% | |

**Table 7. Aesthetic outcomes according to surgical technique**

| Outcome | Grisotti ($n = 20$) | Wise pattern ($n = 20$) | *p*-value |
|---|---|---|---|
| **Surgeon satisfaction (mean ± SD)** | 7.55±1.39 | 8.10±0.72 | 0.128 |
| **Patient satisfaction category, n (%)** | | | 0.549 |
| Fair | 3 (15%) | 2 (10%) | |
| Good | 6 (30%) | 10 (50%) | |
| Excellent | 11 (55%) | 8 (40%) | |

SD: Standard deviation

as excellent, good, and fair in 55%, 30%, and 15% of patients, respectively. In the Wise-pattern group, 40% rated the outcomes as excellent, 50% as good, and 10% as fair.

Surgeon satisfaction scores were 7.55±1.39 in the Grisotti group and 8.10±0.72 in the Wise-pattern group ($p = 0.128$) (Table 7).

### Follow-up

The mean follow-up duration was 6.9 months. No early local recurrences were observed during the follow-up period.

## Discussion and Conclusion

The present randomized study compared the Grisotti technique and Wise-pattern therapeutic mammoplasty in patients undergoing BCS for centrally located breast cancer. Both techniques demonstrated acceptable short-term oncological and aesthetic outcomes.

OPBCS has been widely adopted as a safe alternative to conventional lumpectomy, integrating oncologic resection with reconstructive principles to optimize cosmetic results without compromising cancer control (4-6). Pooled analyses have demonstrated comparable rates of margin negativity and local recurrence between OPBCS and conventional BCS (7). Negative margins were achieved in the majority of patients in both groups, and no statistically significant difference was observed between groups. Although two patients in the Grisotti group required re-excision, clear margins were ultimately obtained in all cases. No early local recurrences were detected during follow-up; however, the limited duration of monitoring precludes conclusions regarding long-term oncologic safety.

Centrally located breast cancers requiring excision of the NAC represent a distinct reconstructive challenge. Several oncoplastic techniques, including the Grisotti flap and reduction-based approaches, have been described to facilitate breast conservation in such cases (8, 9). Contemporary consensus statements emphasize that technique selection should be individualized based on breast size, degree of ptosis, tumor characteristics, and surgeon expertise rather than adherence to a single reconstructive strategy (4-6). In this context, the absence of significant differences in margin status or complication rates between the groups in our study suggests that both approaches can be applied safely when patients are appropriately selected.

Based on our findings and current consensus guidelines, technique selection should be tailored to the individual patient's breast morphology and tumor characteristics. The Grisotti technique is most appropriate for patients with small-to-moderate breast volumes and mild-to-moderate ptosis (Regnault grade I–II), where the central defect can be reliably reconstructed by rotation and advancement of an inferiorly based dermoglandular flap, without requiring extensive parenchymal redistribution. It offers a technically straightforward approach with limited scarring and is particularly useful when the contralateral breast does not require symmetrisation. Its principal limitations include restricted applicability in cases of macromastia or significant ptosis (grade III), where flap reach and capacity for reshaping may be insufficient to achieve satisfactory aesthetic outcomes, and the potential for central breast flattening if parenchymal volume is inadequate.

The Wise-pattern technique is best suited to patients with larger breast volumes, significant ptosis, or those in whom wide parenchymal redistribution is required to fill a larger central defect. It simultaneously achieves breast reduction, mastopexy, and oncological resection and is advantageous when contralateral symmetrisation is planned. Its limitations include a more complex inverted-T scar pattern, longer operative time, and a theoretical risk of wound-healing complications at the T-junction, although these complications were not observed in our series. When breast morphology is intermediate, patient preference, surgeon expertise, and the intended adjuvant treatment plan should guide the final decision. Both techniques should be performed within a multidisciplinary oncoplastic framework with clear margin achievement as the primary oncological endpoint (4-6). These findings reinforce the importance of individualized oncoplastic planning rather than technique standardization.

A significant imbalance in neoadjuvant chemotherapy administration was observed between groups, with higher rates in the Wise-pattern cohort. While tumor diameter and biological subtype distribution were comparable at the time of surgery, the higher pre-treatment tumor burden, as suggested by the NCT distribution, may reflect selection bias toward the Wise-pattern technique for patients with initially larger or more advanced tumors requiring greater parenchymal reshaping. The potential impact of neoadjuvant therapy on surgical complexity and aesthetic outcomes should be considered when interpreting results.

Postoperative complications were infrequent and comparable between groups. Seroma formation was the most common complication, while wound infection and dehiscence were uncommon. No cases of flap necrosis occurred. Previous series evaluating oncoplastic techniques have reported low rates of major complications, with most events managed conservatively and without delay to adjuvant therapy (5, 12). Our findings are consistent with these reports and support the safety of both reconstructive strategies in the early postoperative period.

Aesthetic outcomes were evaluated using both patient-reported and surgeon-reported measures. Patient satisfaction did not differ significantly between groups, and surgeon satisfaction

scores were comparable. Increasing emphasis has been placed on the importance of patient-reported outcomes in oncoplastic breast surgery (6, 12). The comparable satisfaction rates observed in this study align with prior literature suggesting that both local flap and reduction-based techniques can achieve acceptable cosmetic results when carefully planned (8, 10).

The Wise-pattern technique has been described as advantageous in patients with larger or ptotic breasts due to broader parenchymal reshaping and improved symmetry (5, 8). Conversely, the Grisotti technique remains a valuable option in selected cases with moderate breast volume and central defects (8, 9). The absence of statistically significant differences in short-term outcomes within this randomized cohort suggests that both techniques remain viable options for centrally located tumors when applied to appropriately selected patients. Reduction-based techniques employing Wise-pattern skin incisions have also demonstrated reliable reconstructive outcomes in breast surgery, supporting their versatility in managing complex breast defects (14).

### Study Limitations

Several limitations should be acknowledged. The sample size was relatively small, limiting statistical power to detect modest differences. The follow-up was too short to assess long-term recurrence, radiation-related changes, or late cosmetic outcomes. Individual patient follow-up data to calculate the median and range were not available for this report. Additionally, the imbalance in neoadjuvant therapy distribution represents a potential confounding factor. Aesthetic outcomes were assessed using a surgeon-reported VAS and a categorical patient satisfaction scale rather than validated instruments such as the Harvard Breast Cosmesis Scale or BREAST-Q. This limits direct comparability with published literature and reduces the robustness of conclusions regarding aesthetic outcomes. The absence of a validated patient-reported outcome measure such as the BREAST-Q—which encompasses multiple domains including satisfaction with breasts, psychosocial well-being, and physical well-being—represents a further limitation, and future studies should incorporate such instruments prospectively. The retrospective registration of the trial was acknowledged as a further limitation; however, the study design, eligibility criteria, and outcomes were defined prior to enrollment, and ethical approval was obtained before the first patient was recruited. Larger, multicenter studies with extended follow-up and prospective use of validated outcome measures are warranted to further evaluate comparative effectiveness.

In this randomized cohort of patients undergoing BCS for centrally located breast cancer, both the Grisotti and Wise-pattern techniques demonstrated comparable short-term oncological safety and acceptable aesthetic outcomes. Margin status, complication rates, and patient- and surgeon-reported satisfaction did not differ significantly between groups. Within the limitations of sample size and follow-up duration, both approaches appear to be viable reconstructive options when selected according to patient anatomy and tumor characteristics with the Grisotti technique preferred in small-to-moderate-volume breasts with mild-to-moderate ptosis and the Wise-pattern technique offering advantages in macromastia, significant ptosis, or when contralateral symmetrisation is required. Further studies with larger populations and longer follow-up are warranted to confirm long-term oncologic and cosmetic outcomes.

**Ethics**

**Ethics Committee Approval:** The study protocol was approved by the Research Ethics Committee of the Faculty of Medicine, Cairo University (approval code: MD-266-2023, approved on 10 September 2023), prior to patient enrollment.

**Informed Consent:** Written informed consent was obtained from all participants prior to enrollment.

**Footnotes**

**Authorship Contributions**

Concept: I.A.S., K.A.B., A.L., M.H.K., A.S.J.; Design: I.A.S., S.M.M., A.L., M.A.A-M.; Data Collection and/or Processing: A.L., A.M.M., M.H.K., A.S.J., M.A.A-M.; Analysis and/or Interpretation: I.A.S., S.M.M., K.A.B., A.M.M., A.S.J., M.A.A-M.; Literature Search: A.L., A.M.M., A.S.J.; Writing: I.A.S., S.M.M., K.A.B., A.L., A.M.M., M.H.K., A.S.J., M.A.A-M.

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