Grisotti Flap as Oncoplastic Surgery for Retroareolar Breast Cancer

Original Article

Mohamed Ebrahim Mostafa Eldahshan, Ayman Elnemr

Department of General Surgery, Faculty of Medicine, Tanta University Hospital, Egypt.

ABSTRACT

Introduction: The Grisotti procedure involves removing the central breast tumor involving nipple areolar complex and mobilizing a dermo-glandular flap that has been de-epithelized to generate an areola and restore the breast. The goal was to evaluate the technique's impact on oncological outcomes, postoperative side effects, patient and surgeon satisfaction levels.

Patients and Methods: From February 2023 to July 2024, twenty patients with a central breast cancer have been treated using the Grisotti technique.

Results: The median of age of the patients was 58 years (41:75 years). The mean BMI was 30.07kg/m² (23.5:34.5kg/m²). 45% of cases (9 patients) were diagnosed for hypertension and 30% of the cases (6 patients) were treated for Diabetes mellitus. Neoadjuvant chemotherapy was administered to six patients (30%), and three of them showed a partial response. Three cases (15%) had Paget's disease of the nipple, while the bulk of patients (85%, *n*= 17) had invasive ductal carcinomas (IDC). Fourteen patients (70%) reported excellent 6-month subjective patient satisfaction, whereas six patients (30%) reported good satisfaction.

Conclusion: The Grisotti approach is a straightforward process that may be repeated with little difficulty. It enables the reconstruction of a new areola, the repair of the central glandular defect, and a carcinologically satisfactory central lumpectomy.

Key Words: Central breast cancer; central lumbectomy; grisotti flap technique; oncological outcome.

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Corresponding Author: Mohamed Ebrahim Mostafa Eldahshan, MD, Department of General Surgery, Faculty of Medicine, Tanta University Hospital, Egypt. **Tel.:** 01003918271, **E-mail:** dr.eldahshan85@gmail.com

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INTRODUCTION

Among women, breast cancer is the most common cancer. Currently, breast-conserving surgery (BCS) is the accepted treatment for early-stage breast cancer, which replaced radical breast operations due to advancements in radiation and clinical practice[1,2].

A combination of oncologic and plastic surgery, oncoplastic breast surgery (OBS) is gaining popularity, particularly in Western nations. Moving the nipple areola complex (NAC) to the center of the breast, with or without a correction in the other breast, can improve symmetry[3–8]. There are currently other oncoplastic surgical methods accessible, such carefully arranging excisions of the skin and parenchyma, shaping the gland after parenchymal excisions, and more[9]. OBS's idea of combining the breast reduction procedure with a partial mastectomy has gained traction[10–13].

Five to twenty percent of all instances of breast cancer are centrally located breast cancers (CLBC)[14]. In the past, total mastectomy was the preferred treatment for these malignancies, and conservative breast surgery was contraindicated. The concern of tumor multicentricity and local control failure may be the cause of this[15,16].

It is still difficult to surgically handle tumors in the breast's retro areolar region; many surgeons choose to perform radical mastectomy or Obtaining clearance requires both central excision and primary closure. Nonetheless, there is a movement to improve cosmetic operations while reducing the number of mutilating surgeries[17].

BCS is an option for people with CLBC due to advancements in oncoplastic methods. Several studies have shown that BCS is safe in CLBC[18–23].

Furthermore, traditional conservative treatments, such as central quadrantectomies, which involve removing the nipple-areola complex (NAC) and the underlying parenchyma down to the pectoralis fascia, may cause poor cosmetic results, including noticeable distortion of the breast contour and scar contracture in most cases, as well as

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local glandular defects. However, it has been demonstrated that oncoplastic volume displacement or replacement procedures are efficient in restoring the central defect. Selection of the oncoplastic surgery is influenced by the breast volume, its ptotic degree, and the achievement of free safety margins[14].

Central breast-conserving methods that are frequently used include wedge resection, breast reduction plastic surgery, and the purse-string technique. After lumpectomy, the most common procedure for CLBC is the Grisotti procedure, wherein an inferior pedicle is drawn up into the defect using a skin-parenchyma flap[17].

The oncoplastic Grisotti flap technique was first published by Grisotti *et al*., in (1993) as a means of treating retro-areolar breast cancers[24]. By removing the NAC just above the tumor site and extending down to mobilize a dermo-glandular flap that is then de-epithelized, this technique creates an areola and contours the breast. This method prevented the breast from deforming following radiation therapy and removed the "blind breast" look because of the newly restored areola, which improved surgical acceptance. There aren't many researches on this treatment, but the ones that have been done tend to show that both good aesthetic outcomes and carcinological safety are attained.

Patients with moderate-sized breasts and retro areolar malignancies have a great oncoplastic option with the typical Grisotti flap. Additionally, it preserves the breast while producing a pleasing cosmetic outcome in terms of projection and contour[25,26].

To evaluate this oncoplastic technique's viability, oncological safety, surgeon and patient satisfaction from an aesthetic perspective, we carried out a prospective cohort research.

PATIENTS AND METHODS

This prospective study focused on 20 female patients with central breast cancer who underwent prompt reconstruction utilizing the grisotti oncoplastic method after receiving BCS in the Department of General Surgery's Surgical Oncology Unit. Then underwent adjuvant treatment at Tanta University Hospital's Medical Oncology Department, Faculty of Medicine, between February 2023 and July 2024.

During the trial period, all females with central breast cancers who were eligible to have the central defect restored using the grisotti flap procedure were invited to participate. This study includes twenty female patients with retroereolar breast cancer with tumor size ≤5cm.

This study did not include patients who refused breast reconstruction, multicentricity, distant metastases, inflammatory cancer, or extensive skin involvement outside the NAC area.

In our institution, Between February 2023 and July 2024, seventeen patients received a diagnosis of centrally situated invasive ductal carcinoma (IDC), and three patients received a diagnosis of Paget's disease of the nipple. The axillary lymph nodes and breasts were also physically inspected and palpated. An ultrasound examination (breast and axillary assessment) and bilateral mammography were part of each patient's preoperative evaluation. If necessary, both breasts were subjected to magnetic resonance imaging (MRI). Histological and immunohistochemical analyses, including hormone receptor analysis, the Ki67 proliferation index, and HER2 status, were conducted on the tumor biopsies. A pathologist evaluated the histologic tumor margins in each patient during an intraoperative procedure (frozen section).

All patients signed an informed consent, and a cardiologic and anesthetic consultation was done before undergoing any surgical procedure. Every participant was informed of any unforeseen dangers that arose throughout the study after receiving approval from institutional ethical committee.

There were adequate provisions to maintain privacy of participants and confidentiality of data. The results of the study were used as a scientific material only and were not be used by any legal authorities.

Grisotti flap technique was applied to all patients:

The NAC contour was defined first, then the inframammary sulcus and a smaller circle directly below NAC. Following that, the medial and lateral borders of the flap were delineated. These borders extended from the areolar's medial and lateral margins to the inframammary fold, laterally convergent to form a comma.The flap was thereafter completely de-epithelialized, with the exception of the new areola (Figure 1).

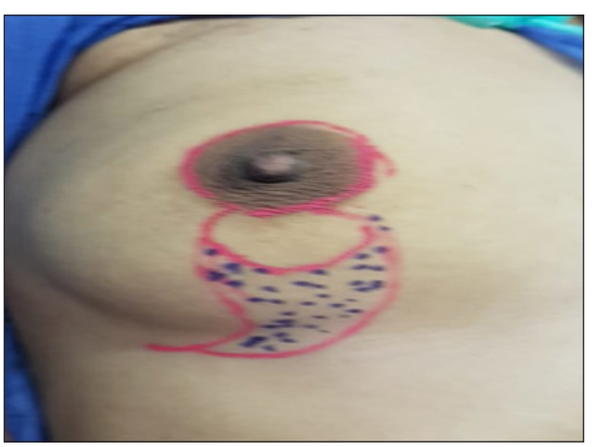

Fig. 1: Marking of Grisotti flap. The dotted area will be deepithelialized.

Removing a column of tissue that extended from the subcutaneous layer to the pectoral fascia, the specimen's borders were marked for intraoperative frozen section examination during a central quadrantectomy that encompassed the tumor and NAC. Along the tumor bed's edges, four titanium clips were positioned to make adjuvant radiation therapy easier. After the flap's inferior and medial borders were cut down to the pectoral fascia, the flap was widely mobilized from the pectoral fascia and rotated and advanced to cover the defect. Figure (2) using full suture of the injuries (Figure 3). The axillary LN was dissected by making a second, independent incision in the axillary fold. The same process was used for nipple Paget disease.

Fig. 2: Mobilization of grisotti flap to replace the defect after central quadrantectomy.

Fig. 3: Closure of wounds after insertion of drain.

Pathological evaluation:

Every specimen was examined using histology and immunohistochemistry, including ER, PR, Her-2-neu, and ki-67. In every instance, the margins were considered negative. Chemotherapy, radiation, biological treatment, and hormone therapy, if necessary, were all used in the completion of oncological therapies in accordance with national regulations.

Follow-up:

To assess the healing process and plan follow-up care, a postoperative appointment with the surgeon was conducted three weeks following the procedure (Figures 4,5). A follow-up surgical consultation, which included breast and axillary palpation, was scheduled for all patients three months following surgery and then at three-month intervals thereafter. As per the conventional practice, ultrasonography, mammography, and tumor markers (CA 15-3) were performed. MRIs were performed when needed. After their adjuvant therapies (chemotherapy and/or radiation), they should also assess the long-term outcomes and recommend potential complimentary surgeries (nipple repair, breast symmetry, and tattooing).

Fig. 4: After one week of the surgery with inserted drain.

Fig. 5: After three weeks of surgery.

Aesthetic evaluation by patients and surgeons:

Based on a scale of 1 to 5, the patient's level of satisfaction with the surgical cosmetic result was evaluated (1 being undesirable and 5 being excellent). The patient provided the initial score for the aesthetic outcome, which was utilized by Pezzi *et al*.,[27] Clough *et al*.,[28] employed a score to gauge surgeons' satisfaction with the cosmetic result; however, since not all patients could be examined after their adjuvant treatment was finished, the score for satisfaction following radiation was not kept. A nurse practitioner and two surgeons documented our rating approach, which yielded an overall score ranging from 1 to 5.

RESULTS

Patient characteristics:

From february 2023 to july 2024, We carried out the Grisotti flap on twenty female patients with central breast tumors. The median of age of the patients was 58 years (41:75 years). The mean BMI was 30.07kg/m^2 (23.5:34.5kg/m^2). 45% of cases (9 patients) were diagnosed for hypertension and 30% of the cases (6 patients) were treated for Diabetes mellitus. Neoadjuvant chemotherapy was administered to six patients (30%), three of whom responded partially and three of whom did not (Table 1).

Preoperative assessment

Based on the radiological assessment, the mean initial lesion size before surgery including Patients who received neoadjuvant chemotherapy was 2.9cm. (1.2:4.8cm) (Table 1). Three patients (15%) had Paget's disease of the nipple, while the bulk of patients (85%, *n*= 17) had invasive ductal carcinomas (IDC) (Table 1).

Table 1: Characteristics of the all patients with centrally located breast cancer and initial tumor Characteristics:

Patient characteristics	Number of patients
Age median (years)	58 years (41 y.:75 y.)
BMI (mean)	26.5 (19.5 : 33.4)
Comorbidities: DM	6
Hypertension	9
Complaint of patient breast mass	13
Nipple disorders	5
Axillary lymph nodes	2
Initial size of tumor (mean)	2.9cm (1.2cm : 4.8cm)
TNM Staging T1	7
T2	13
Histologic type	
Paget's disease	3
Invasive ductal carcinoma (IDC)	17
Negative resection margins	20
Time of the operation by minutes (mean)	96.75min. (75min.:115min.)

Surgical characteristics:

All patients had safety margin resections verified by intraoperative frozen section following the central lumpectomy. There were no complications throughout the procedure. Operating time averaged 96.75 minutes (75:115 minutes). Experience tended to shorten the operational time (Table 2).

Postoperative analysis:

IDC accounted for 85% of the postoperative tumor analysis results. With a mean pathological tumor size of 1.9mm (0.6:3.7mm), the specimen weighed 64.75g on average (45:85g). The average length of stay in the hospital was 4.3 days (3:5 days). The hospitalization term was free of problems. The complication incidence was around 15%; according to the Clavien Dindo classification, three patients had grade I to II problems (2 seroma, 1 scar breakdown)[29]. All patients had negative margins. In Table (2), postoperative histological features are described in detail (Table 2).

Table 2: postoperative pathological characteristics and follow up:

Tumor characteristics	Number of patients
Histopathological type IDC	17
Paget's disease	3
Pathological tumor size mean (cm)	1.9 cm(0.6:3.7cm)
Weight of the resected sample mean(gm)	64.75gm(45:85gm)
Hospitalization period mean (days)	4.3(3:5) days
Follow up period median (months)	11 m. (6:18 m.)
Complications Seroma	2
Scar breakdown	1
Recurrence local recurrence	1
Distant metastasis	1

Follow-up:

The median follow-up time was 11 months (6:18 months). One patient with local recurrences was detected

during this period (after 15 months) and mastectomy was done. Another One patient presented with distant metastasis in bone (vertebrae) 12 months after surgery. Adjuvant chemotherapy, radiation and hormonal therapy were beneficial to her.

Satisfaction rates and aesthetics results:

both the surgeon's and the patient's pleasure in order to assess the aesthetic results. Excellent (five points), good (four points), fair (three points), bad (two points), and extremely poor (one point) were indicative of the patient's subjective satisfaction with her breast reconstruction. (Figure 6) Six patients had good (60%), and 14 patients had excellent (70%), 6-month subjective patient satisfaction. The average score for Clough's aesthetic assessment was 4.4.

Fig. 6: Excellent esthetic outcome grisotti flap technique after 3 months.

DISCUSSION

The conventional therapy for breast cancer, mastectomy, has historically been preferred over breast conservation surgery (BCS) for patients with CLBC, who account for five to twenty percent of all occurrences of breast cancer[30]. Due to the high frequency of NAC involvement linked to these malignancies, nipple and areola resection is required, along with a sufficient safety margin surrounding the tumor. This procedure has shown satisfactory esthetic outcomes and oncological control[31].

The best way to treat Paget's disease of the nipple is still up for debate, despite the fact that it has been well researched. Dixon *et al*.[32] published the findings from 48 Paget's disease cases without a palpable lump in 1991. These patients received either a standard mastectomy or cone excision of the NAC. Given that locoregional recurrence was seen in only 5.4% of individuals after mastectomy and 40% of cases after cone excision, they recommended mastectomy in these situations. However, several studies concluded that BCT could be safely recommended to Paget's disease patients[33].

Since central breast tumors are localized and There is concern that the breast ducts will be massively invaded. it is especially important to understand the various oncoplastic techniques. The preferred surgical technique for these tumors is total mastectomy, which prioritizes carcinological safety over the finished cosmetic outcome[30,34]. Moreover, several medical teams and patients have expressed dissatisfaction with the results of routine conservative surgery for central breast cancer, especially following adjuvant radiation therapy[35]. Instead, some surgeons recommend a mastectomy, namely a skin-sparing mastectomy[36].

The advent of oncoplastic surgery in recent years has allowed for advancements in the treatment of breast tumors[37]. It allows for a huge parenchymal excision with a very good cosmetic result, while providing the same oncological safety as a total mastectomy. Many oncoplastic approaches have been described for the treatment of breast cancer[28,38,39]. Because of the psychological effects of reconstruction on the patient, these strategies have become crucial to master in the management of breast cancer[34].

It was in (1993) that the author of the same name first detailed the Grisotti technique[24]. His group removed the NAC and quickly restored the areola after performing a central lumpectomy. 32 months was the median follow-up period, and none of the patients experienced local or distant recurrences. Both the authors and the patients expressed satisfaction with the aesthetic outcomes. They concluded that this technique produced extremely good aesthetic outcomes and was safe from an oncological standpoint. In our study; During the hospitalization time, there were no complications. A 15% chance of complications occurred. Three individuals were identified based on the Clavien Dindo categorization as having grade I to II problems[29]. Additionally, 70% of patients had excellent 6-month subjective patient satisfaction, while 30% had good 6-month. The average score for Clough's aesthetic assessment was 4.4.

Another study assessing this process was conducted by Della Rovere *et al*., and published in (2007)[40] 17 of the 25 patients had excellent aesthetic outcomes and a high satisfaction rate. However, neither the surgeon's satisfaction rate nor the satisfaction scores were examined in detail in this study. There was no information on long-term follow-up.

Many oncoplastic lumpectomy approaches, such as the round block technique, the Grisotti surgery, the lower and upper pedicle techniques, volume replacement with a latissimus dorsi flap, and breast prosthesis, were compared by Petit *et al*., Both patients and surgeons reported that the Grisotti method operation generated good aesthetic outcomes[41]. Thirty patients who presented with a central breast tumor and benefited from various oncoplastic procedures were included in a more recent study by Farouk

et al.,[42] Eight of them benefited from a Grisotti-style central lumpectomy. 70% of the 30 patients thought the cosmetic outcome was great, 6% thought it was good, and 3% thought it was fair. No instances of distant or immediate recurrence were observed during this investigation. Nevertheless, subgroups based on the surgical approach were not considered for the aesthetic rating.

In a related study, 21 patients who had oncoplastic surgery for central breast tumors were examined; three of these individuals received the Grisotti procedure[43]. In 30% of cases, the patient expressed excellent with the cosmetic outcome, 55% expressed good, and 15% expressed fair satisfaction. Once more, the outcomes made it impossible to assess the Grisotti technique's effectiveness. A research by Huemer *et al*.,[44] examined the aesthetic pleasure and safety of breast-conserving surgery in 31 individuals treated for central malignancies. Two patients experienced distant metastases, but there were no patients of local recurrence during the 33.8-month follow-up period on average. Nine individuals in this study experienced very satisfactory cosmetic outcomes after using the Grisotti procedure.

In our study, the median follow-up time was 11 months. During this follow up period, one patient with local recurrences was detected during this period (after 15 months) and mastectomy was done. Another one patient presented with distant metastasis in bone (vertebrae) 12 months after surgery. The modest number, which is limited to 9% of instances of breast cancer due to the relative rarity of the CLBC, can help to explain this[45]. The short follow-up period, which wasn't really one of the primary goals of this endeavor, could be another factor.

In a different study, Emiroglu *et al*., evaluated the survival rate of 42 patients with advanced breast tumors (central or not) following localized control and oncoplastic operations[46]. The Grisotti approach helped five of the forty-two patients. According to the findings, oncoplastic operations did not raise the chance of either local or distant recurrences. The satisfaction score was 88.2%, and 79.4% of the patients rated the cosmetic results as satisfactory to excellent.

Only a small number of researches have assessed the Grisotti technique's aesthetic outcomes. For central tumors, the outcomes were frequently combined with those of other oncoplastic procedures. All results, however, concur that this treatment is quick and provides good aesthetic outcomes, such a move that is obviously less deformative than drastic surgery, such as a complete mastectomy, and acceptable breast symmetry with little morbidity. Most of these studies' weak point is the small number of patients they include; a multicenter research could help overcome this bias.

Our investigation demonstrated both good esthetic outcomes and carcinogenic safety. A benefit was that it only evaluated the Grisotti oncoplastic process. We performed extensive parenchymal excisions with a substantial incidence of free margins, despite the occasional presence of enormous tumors. The rate of complications in the research was acceptable. In our study, the average length of hospital stay was 4.3 days (3–5 days); certain risks could be reduced by utilizing drainage. To assess the viability of the recently rebuilt areola, the patients were first admitted to the hospital. Then, considering the small number of complications. A very high percentage of satisfaction was indicated by the total patient satisfaction score, which was found to be between satisfactory and excellent even for patients with few problems.

Furthermore, despite the fact that NAC reconstruction is a far simpler procedure than contralateral summarization, all of the patients in our study were reluctant to have it done. This was also noted by other authors, including Italians and Egyptian colleagues[24] and suggests that the most important thing for women, particularly in societies that are more conservative, is to simply preserve the breast mound for a feminine body contour.

Postoperative consultations made it possible to guarantee long-lasting cosmetic outcomes. Additionally, the surgeons had a very high satisfaction rating. Prospective studies are needed for long-term assessment (oncological safety, aesthetic outcomes), before and after adjuvant treatment (especially after radiation), and considering the potential for a multicenter study are necessary to support these optimistic data.

CONCLUSION

The oncoplastic Grisotti procedure is regarded as a good substitute for mastectomy, despite the fact that it can be difficult to repair the central defect following the removal of the central breast tumors and yields a satisfying aesthetic result with reduced morbidity. Even for central mammary tumors with a significant volume, it is a useful therapeutic aid. Due to the procedure's ease of learning, speed, and manageable risk of complications, both patients and surgeons are happy with it. In order to assess the long-term survival results of this surgical procedure, more extensive long-term research involving a greater number of patients is necessary.

CONFLICT OF INTERESTS

There is no conflict of interests.

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