



Grisotti flap for central quadrant breast tumours: quick, cosmetic and easy to learn – a case series

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Abstract – Background: Breast cancer surgery has moved away from mutilating mastectomies to organ preservation approach keeping in mind the cosmetic outcome. Centrally located tumours are particularly notorious as they often require resection of the nipple-areola complex (NAC) thus creating a gross cosmetic defect. However, cosmesis is possible even after such surgeries. **Methods:** Seven consecutive patients with centrally located breast tumours were subjected to breast conservation surgery – either upfront or after neoadjuvant chemotherapy – followed by reconstruction with Grisotti flap. All patients were followed up for a minimum period of 3 months after surgery. None of them had any flap related complications and reported satisfactory cosmetic outcome with no loss of body image. **Interpretation:** Lumpectomy with resection of the NAC with Grisotti flap reconstruction is a relatively fast procedure with a short learning curve. In our case series of 7 women, all underwent successful breast reconstruction with minimum morbidity and excellent cosmetic outcome.

Key words: Grisotti flap, Central quadrant tumours, Breast conservative surgery, Oncoplastic techniques.

Introduction

Breast cancer is among the most common malignancies in women and in the three most common cancers worldwide. According to literature centrally located breast tumours represent 5–20% of all breast cancer cases [1]. Radical mastectomy developed a century ago has now been replaced, in the majority of the cases, by the more cosmetically acceptable breast conservation surgery (BCS) [2]. Traditionally, conservative breast surgery was not well accepted for centrally placed tumours due to need for excision of the nipple-areola complex (NAC) and underlying cylinder of parenchyma down to the pectoralis fascia leading to local glandular defects and poor aesthetic outcome including loss of NAC, distortion of breast contour and scar contracture in most cases. However, restoration of the central defect by the oncoplastic volume displacement or replacement techniques has been shown to be effective [3].

Case introduction

In this present case series, we took cases with central quadrant tumours which were operated with Grisotti flap repair in Dr. B. Borooah Cancer Institute from January 2022 to December 2022. A total of 7 cases were operated with Grisotti

flap repair in the period mentioned and the data was collected in a retrospective manner.

Of the 7 patients, the average age was 53 years and ranged from 37 to 73 years; all malignancies were pathologically proven with pre-operative core needle biopsies; preoperative mammogram was done in all the cases; 6 patients were operated upfront and 1 received neo-adjuvant chemotherapy (NACT); 6 were post – menopausal; axillary lymph node dissection (ALND) was done in 3 (cN+) and sentinel lymph node biopsy (SLNB) in 4 (cN0) patients which were all negative for malignancy. Adjuvant radiotherapy was given in all cases except 1, where the final pathology report was ductal carcinoma in situ (DCIS). Mean duration of surgery was 74 minutes (range 62–96 min).

On the OT table, after cleaning and draping, skin incisions were placed as shown in Figure 1A. The lower extension of the flap was planned along the infra-mammary crease. The NAC was resected, going down to the pectoral fascia, taking care to ensure adequate circumferential margin while avoiding bevelling of the inferiorly placed skin island. Following lumpectomy, a specimen mammogram (Figure 1B) was taken for all cases which showed micro-calcifications completely included within the specimen. To further bolster the margin safety status, frozen section (FS) analysis was done which showed all margins to be clear. Metallic clips were placed on the four walls to mark the area for radiotherapy. In the waiting period for FS reports, ALND or SLNB was completed.

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Figure 1. Depicting the stages of surgery: A – skin incisions after lumpectomy; B – specimen mammogram - red arrow marks the microcalcifications; C – after mobilisation of the inferior pedicle.

Following this, the skin paddle inferior to the island was de-epithelised with a size 15 blade and the medial edge of the pedicle was bevelled going down to the pectoral fascia (Figure 1C). The purpose of this was to give the skin island adequate mobility to reach the NAC region without tension on the supplying pedicle. The skin island was pulled up to reach the NAC area and first sutured in the 12, 3, 6 and 9 o'clock position with absorbable monofilament 3-0 sutures and intermittent sutures were placed circumferentially between these. The suturing was extended downwards to close the skin defect over the de-epithelised area (Figure. 2).

The patients were observed 48 hours for any signs of ischaemia of the skin paddle or excess drain output and discharged on the third day of surgery. Post-operative follow-up after 2 weeks revealed a healthy healed suture line and no discoloration of the skin island.



Figure 2. After skin closure.

Post-operative follow up

In our series, patients underwent clinical evaluations every two weeks during the first month post-surgery, followed by monthly assessments thereafter for three months. This schedule aligns with standard postoperative care protocols for oncoplastic breast surgeries, ensuring timely identification and management of any complications.

Evaluation criteria

Our assessments focused on several key aspects:

- **Wound Healing:** Monitoring for signs of infection, hematoma, or seroma formation.
- **Flap Viability:** Evaluating the reconstructed area for adequate blood supply and absence of fat necrosis.
- **Breast Symmetry and Contour:** Assessing the aesthetic outcome, including breast shape, volume, and symmetry relative to the contralateral breast.
- **Scar Quality:** Observing the surgical scar for hypertrophy, keloid formation, or other abnormalities.

All the patients are in follow up as of June, 2024. Patient-reported outcomes were integral to our evaluation, with patients expressing satisfaction with the cosmetic results in a subjective assessment during follow-up visits.

Discussion

Over the past few decades, breast surgeons have moved away from the Halstedian approach to breast cancer to a more conservative, organ preservation approach with a cosmetically acceptable outcome, considering that the breast is considered a symbol of femininity. Werner Audretch, ushered in a major change with his concept of oncoplastic breast surgery involving complete removal of the tumour while preserving the natural shape with minimal cosmetic deformity [4]. Schrenk et al. [5] further evolved it to include partial or total mastectomy with reconstruction using loco-regional or even free flaps, contralateral breast symmetrisation and NAC reconstruction.

Centrally located breast tumours demand of the surgeon a knowledge of oncoplastic reconstructive techniques because of their location and resultant aesthetic matters regarding the

nipple angulation and the upper and lower pole slopes [6]. The traditionally preferential technique of mastectomy in these tumours has been replaced by less intrusive techniques. The commonly used oncoplastic techniques for central quadrant tumours are the Grisotti flap, batwing and hemi-batwing techniques [7, 8] which allows resection of large glandular areas to ensure oncological safety while providing satisfactory cosmetic outcome to the patient.

Grisotti in 1993 [9] first described the eponymous flap for immediate reconstruction of the NAC following excision of centrally placed tumours in 37 patients. At a median follow-up of 32 months, none of the patients developed recurrence. The cosmetic outcome was acceptable to both author as well as the patients.

The Grisotti flap is most effective for patients with small to medium-sized breasts (B/C cup size), allowing for adequate tissue mobilization and a tension-free reconstruction of the nipple-areola complex. Larger breast size may be considered for other oncoplastic techniques to address the complexity of tissue mobilisation. Typically, 10–20% of the breast volume, including the tumour and a margin of healthy tissue, is removed. This ensures oncological safety while maintaining an aesthetically acceptable outcome. Symmetry surgery, if required, is planned after healing and completions of adjuvant therapies like radiation. This allows tissue to stabilize for optimal results and prevents post RT scarring and deformity. The patients included in our series did not undergo symmetry surgery. Fat necrosis is a known complication in breast reconstruction and its occurrence is influenced by factors like flap weight and blood supply. Literature suggests rates ranging from 1% to 9% [10] in similar reconstructive procedures. In our study, we did not specifically assess fat necrosis beyond routine follow-up protocols guided by national comprehensive cancer network (NCCN) recommendations. Apart from the operative scar, no cases of deformity were observed in our series.

The Grisotti technique is a stand-alone technique has not been discussed in a large number of studies and is mostly coupled with other oncoplastic techniques. As a result, the merits of this flap are often overshadowed by the rest. However, this case series shows that the Grisotti flap for NAC reconstruction is an easy to perform local flap, can be performed rapidly, with a short learning curve and does not have significant morbidity or failure rates, while offering aesthetic satisfaction to patients and surgeons alike. We acknowledge that while our follow-up regimen is consistent with accepted practices, incorporating standardized cosmetic evaluation scales, such as the Harris Scale [11] or the Breast-Q [12] questionnaire, could provide more quantifiable data in future studies.

Conclusion

For centrally located breast tumours Grisotti technique is an easy-to-learn technique, quick to perform, with minimal complication rates, satisfactory aesthetic outcomes and no loss of body image in the post-operative period.

Funding

No funding was sought as the procedure described does not require any additional drugs or equipment liable to bear an additional cost.

Conflicts of interest

The authors declare no conflicts of interest.

Data availability statement

This article has no associated data generated and/or analysed.

Author contribution statement

Conceptualisation, review of draft, surgery: Dr. Shivaji Sharma.
Data collection, preparation of draft: Dr. Karan Pao.

Ethics approval

Ethical approval was not required as this is a case series and individual consent was taken.

Informed consent

Written informed consent was obtained from the patients for the publication of this report and any accompanying images.

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