

Case Report

TYPE I ONCOPLASTIC BREAST-CONSERVING SURGERY INCORPORATING MODIFIED RACQUET ONCOPLASTY AND LIMBERG FLAP RECONSTRUCTION: A TWO-CASE REPORT

Vikashni.S¹, Arul kumaran.M², Suren Prasanna.S³

Received : 20/05/2026
Received in revised form : 10/07/2026
Accepted : 24/07/2026

Keywords:

Oncoplastic breast surgery, Modified racquet oncoplasty, Limberg flap, Breast conservation surgery, Sentinel lymph node biopsy.

Corresponding Author:

Dr. Vikashni.S,
Email: vikashni27@gmail.com

DOI: 10.47009/jamp.2026.8.4.286

Source of Support: Nil,
Conflict of Interest: None declared
Written informed consent was obtained from both patients for publication of clinical details and images

Int J Acad Med Pharm
2026; 8 (4); 1688-1691



¹Resident, Department of General Surgery, Government Mohan Kumaramangalam Medical College, Salem, Tamilnadu, India.

²Professor, Department of General Surgery, Government Mohan Kumaramangalam Medical College, Salem, Tamilnadu, India.

³Assistant Professor, Department of General Surgery, Government Mohan Kumaramangalam Medical College, Salem, Tamilnadu, India.

ABSTRACT

Oncoplastic breast surgery (OPBS) combines oncological safety with improved cosmetic outcomes and has become an integral component of modern breast cancer management. We present two cases managed with Type I oncoplastic breast-conserving surgery using modified racquet oncoplasty and Limberg flap reconstruction. Case 1 involved a small tumour located close to the nipple–areolar complex (NAC), managed with modified racquet oncoplasty and sentinel lymph node biopsy (SLNB). Case 2 involved a parasternal tumour with pectoralis muscle involvement, treated with neoadjuvant chemotherapy followed by breast-conserving surgery and Limberg flap reconstruction. In both cases, intraoperative frozen section and SLNB enabled completion of definitive surgery in a single stage. Both patients achieved excellent oncological and cosmetic outcomes. This report highlights the versatility of oncoplastic techniques tailored to tumour location and the importance of intraoperative decision-making.

INTRODUCTION

Breast-conserving surgery (BCS) has become the standard of care for early-stage breast cancer, offering survival outcomes equivalent to mastectomy when combined with radiotherapy. However, conventional BCS may result in poor cosmetic outcomes, particularly when tumours are located in cosmetically sensitive areas or when a significant volume of tissue is excised.^[1,2]

Oncoplastic breast surgery (OPBS) integrates plastic surgical techniques into oncological resection, enabling wider excision while preserving breast shape and symmetry. Techniques are selected based on tumour location, breast size, and expected defect, with racquet oncoplasty commonly used for tumours located near the upper quadrants or close to the nipple areola complex (NAC). Volume displacement techniques such as modified racquet oncoplasty are suitable for small to moderate defects, whereas volume replacement techniques, including the Limberg (rhomboid) flap, are useful in medial or parasternal defects where local tissue rearrangement is insufficient. We report two cases demonstrating tailored application of Type I oncoplastic techniques using modified racquet oncoplasty and Limberg (rhomboid) flap, highlighting the role of frozen

section and SLNB in achieving single-stage definitive management.^[3,4]

CASE PRESENTATION

Case 1

A 41-year-old premenopausal woman presented with spontaneous yellowish serous discharge from the right nipple, associated with a painless lump in the right breast for two months. There were no associated systemic symptoms.

Clinical examination revealed a 2 × 1 cm firm, mobile lump at the 2 o'clock position in the upper inner quadrant of the right breast, located close to but not involving the nipple–areolar complex. A single ipsilateral axillary lymph node measuring 1 × 1 cm was palpable.

Triple assessment was performed. Mammography and ultrasonography demonstrated a suspicious lesion (BI-RADS 4A). FNAC confirmed malignancy. FDG PET-CT revealed a localized lesion without nodal or distant metastasis. The disease was staged as cT1N1M0 (Stage IIA).

Surgical Management

Considering the tumour's proximity to the NAC and the risk of cosmetic deformity, Type I oncoplastic breast-conserving surgery using modified racquet oncoplasty was performed. A racquet-shaped

periareolar incision with radial extension enabled wide local excision with adequate margins while preserving the NAC. The specimen was oriented and sent for intraoperative frozen section analysis. Sentinel lymph node biopsy (SLNB) was performed using dye technique.

Outcome

Frozen section confirmed negative margins. Sentinel lymph nodes were negative for metastasis. Final histopathology confirmed pT1cN0M0 encapsulated papillary carcinoma.

ER +, PR+, HER2neu- patient was given post op chemotherapy and radiotherapy.

The patient had an uneventful recovery with preservation of breast contour and NAC, achieving a satisfactory cosmetic outcome and post op follow up showed no recurrence.



Figure 1: Breast Conservation Surgery with Modified Raquet Oncoplasty Technique

Case 2

A 46-year-old premenopausal woman presented with a progressively enlarging lump in the parasternal region of the right breast for three months. There was no nipple discharge or skin involvement.

On examination, a 2 × 2 cm firm mass was noted in the parasternal region with restricted mobility. No axillary lymphadenopathy was present.

Imaging and PET-CT demonstrated a metabolically active lesion with infiltration of the pectoralis major muscle, without distant metastasis. Excision biopsy confirmed invasive ductal carcinoma (ER/PR positive, HER2 negative).

Neoadjuvant Chemotherapy

Due to muscle involvement, the patient received six cycles of Adriamycin and Cyclophosphamide,

resulting in significant tumour regression and resolution of muscle infiltration.

Restaging Evaluation

Post-chemotherapy reassessment included clinical examination and repeat PET-CT.

Restaging demonstrated:

- Marked Reduction In Metabolic Activity of the Primary Lesion,
- Regression of Pectoralis Major Muscle Infiltration,
- No Newly Detected Metastatic Disease,
- Absence of Suspicious Regional Nodal Involvement.

The patient was therefore considered an excellent candidate for **breast-conserving surgery**.

Surgical Management

Following response, breast-conserving surgery was performed using Limberg flap reconstruction,^[14,15] to address the medial defect.

Wide local excision was performed and a Limberg flap was transposed to restore breast contour.

Frozen section analysis confirmed clear margins, and SLNB was negative.

Outcome

Final histopathology showed ypT1c ypN0 disease, indicating good response to chemotherapy. The postoperative course was uneventful, with excellent contour restoration and no flap-related complications.



Figure 2: Breast Conservation Surgery with Limberg Flap Reconstruction

DISCUSSION

Oncoplastic breast surgery (OPBS) has significantly expanded the scope of breast-conserving surgery by allowing wider excision margins without compromising cosmetic outcomes. Multiple randomized trials have established the oncological

safety of breast conservation compared to mastectomy.^[1,2]

The landmark NSABP B-06 Trial demonstrated equivalent overall survival between mastectomy and lumpectomy followed by radiotherapy, establishing breast conservation as a standard treatment modality.^[1] Similarly, long-term results from the Milan Trial confirmed comparable survival outcomes, reinforcing the safety of conservative approaches.^[2]

Despite these oncological equivalences, conventional breast-conserving surgery may result in suboptimal aesthetic outcomes, particularly in tumours located in cosmetically sensitive regions such as near the nipple–areolar complex or medial breast. OPBS addresses this limitation by combining oncologic resection with plastic surgical techniques.

Modified racquet oncoplasty is a versatile Type I oncoplastic technique particularly suited for tumours located in the upper quadrants or close to the NAC. It enables adequate resection while preserving breast contour and symmetry. Clough et al. classified oncoplastic techniques based on the extent of glandular mobilization, with Type I techniques indicated for defects involving less than 20% of breast volume.^[3]

In Case 1, the tumour was located close to the NAC, a region associated with a higher risk of postoperative deformity. The use of modified racquet oncoplasty allowed precise excision with preservation of the NAC and satisfactory cosmetic outcome. Studies have shown that oncoplastic techniques reduce re-excision rates and improve margin clearance compared to conventional lumpectomy.^[4,11]

Case 2 highlights the importance of a multimodal approach in locally advanced disease. The use of neoadjuvant chemotherapy enabled tumour downstaging, allowing breast conservation in a case with initial pectoralis muscle involvement. Trials such as the EORTC 10902 Trial have demonstrated that neoadjuvant chemotherapy increases the rates of breast conservation without adversely affecting survival outcomes.^[5]

Medial and parasternal tumours pose reconstructive challenges due to limited tissue availability. In such cases, volume replacement techniques become essential. The Limberg (rhomboid) flap is a reliable local transposition flap that provides adequate tissue for defect closure with minimal donor site morbidity. Its geometric design allows tension-free closure and good contour restoration, making it particularly useful for medial defects.^[6]

A critical aspect of both cases was the use of intraoperative frozen section analysis and sentinel lymph node biopsy (SLNB). Frozen section allows immediate assessment of surgical margins, significantly reducing the need for reoperation^[15]. SLNB provides accurate axillary staging while minimizing morbidity associated with axillary lymph node dissection. The NSABP B-32 Trial established SLNB as the standard of care in clinically node-

negative breast cancer, demonstrating equivalent survival with reduced complications.^[8]

The integration of these intraoperative techniques enabled completion of definitive oncologic surgery in a single stage, which is particularly important in resource-limited settings and improves patient satisfaction.

Overall, these cases illustrate how tailored oncoplastic approaches based on tumour location, combined with evidence-based systemic therapy and intraoperative decision-making, can achieve optimal oncological and cosmetic outcomes.

CONCLUSION

Modified racquet oncoplasty is a safe and effective oncoplastic technique for breast conservation, particularly in tumours located close to the nipple–areolar complex, as demonstrated in Case 1. In more advanced disease, as seen in Case 2, the integration of neoadjuvant chemotherapy can facilitate tumour downstaging and enable breast-conserving approaches. The routine use of intraoperative frozen section and sentinel lymph node biopsy allows accurate margin assessment and axillary staging, enabling completion of definitive surgery in a single operative setting. Together, these strategies optimize oncological safety while preserving cosmetic outcomes, supporting their role in contemporary breast cancer management.

REFERENCES

1. Fisher B, Anderson S, Bryant J, et al. Twenty-year follow-up of a randomized trial comparing total mastectomy, lumpectomy, and lumpectomy plus irradiation for invasive breast cancer. *N Engl J Med*. 2002;347(16):1233–1241.
2. Veronesi U, Cascinelli N, Mariani L, et al. Twenty-year follow-up of a randomized study comparing breast-conserving surgery with radical mastectomy. *N Engl J Med*. 2002;347(16):1227–1232.
3. Clough KB, Kaufman GJ, Nos C, Buccimazza I, Sarfati IM. Improving breast cancer surgery: classification and atlas for oncoplastic surgery. *Ann Surg Oncol*. 2010;17(5):1375–1391.
4. Losken A, Dugal CS, Styblo TM, Carlson GW. Meta-analysis comparing breast conservation therapy alone to oncoplastic technique. *Ann Plast Surg*. 2014;72(2):145–149.
5. Van der Hage JA, van de Velde CJH, Julien JP, et al. Preoperative chemotherapy in operable breast cancer. *J Clin Oncol*. 2001;19(22):4224–4237.
6. Limberg AA. Design of local flaps. *Sov Surg*. 1966;5:73–77.
7. Giuliano AE, Hunt KK, Ballman KV, et al. Axillary dissection vs no dissection. *JAMA*. 2011;305(6):569–575.
8. Galimberti V, Cole BF, Zurrada S, et al. Sentinel-node micrometastases trial. *Lancet Oncol*. 2013;14(4):297–305.
9. McCulley SJ, Macmillan RD. Therapeutic mammoplasty outcomes. *Br J Plast Surg*. 2005;58(7):902–907.
10. Clough KB, Lewis JS, Couturaud B, et al. Oncoplastic techniques allow extensive resections. *Ann Surg*. 2003;237(1):26–34.
11. Fitoussi AD, Berry MG, Fama F, et al. Oncoplastic breast surgery analysis. *Plast Reconstr Surg*. 2010;125(2):454–462.
12. Urban C, Lima RS, Schunemann E Jr, et al. Oncoplastic principles. *Breast*. 2011;20(Suppl 3):S92–S95.
13. Chang EI, Peled AW, Foster RD, et al. Extended partial mastectomy feasibility. *Ann Surg Oncol*. 2012;19(10):3281–3287.

14. De Lorenzi F, Hubner G, Rotmensz N, et al. Long-term outcomes of oncoplastic surgery. *Ann Surg Oncol*. 2016;23(4):1157–1163.
15. Osako T, Nishimura R, Nishiyama Y, et al. Intraoperative frozen section analysis for surgical margins in breast-conserving surgery. *Breast Cancer*. 2007;14(4):387–394.