Novel Postoperative Cavity Remodeling Technique in Oncoplastic Breast-Conserving Surgery: A Case Series

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Abstract

Background

Large-volume defects (≥50%) after breast-conserving surgery often lead to contour depression and asymmetry. Traditional flap or implant reconstruction can restore volume but increases operative trauma, cost, and donor-site or foreign-body risks. This study evaluated the feasibility and early outcomes of the Postoperative Cavity Remodeling Technique (PCRT) in patients with MRI-confirmed ≥50% breast volume loss.

Methods

A single-center retrospective cohort study including patients with ≥50% MRI-measured volume deficit. PCRT applies radial sutures to stabilize the resection cavity and establish a tension-balanced, remodelable chamber. Evaluations included:

- Seroma dynamics
- Incision-related complications
- Postoperative tension/pain (VAS)
- Harris aesthetic score
- BREAST-Q satisfaction

Results

Seroma & Pain

- Peak at 1 week: 28.3% required aspiration
- Pain reduction: 73.3% → 6.7% from week 1 to month 3

Complications

- Incision-related complications: 10%, all mild

Aesthetic & Patient-Reported Outcomes

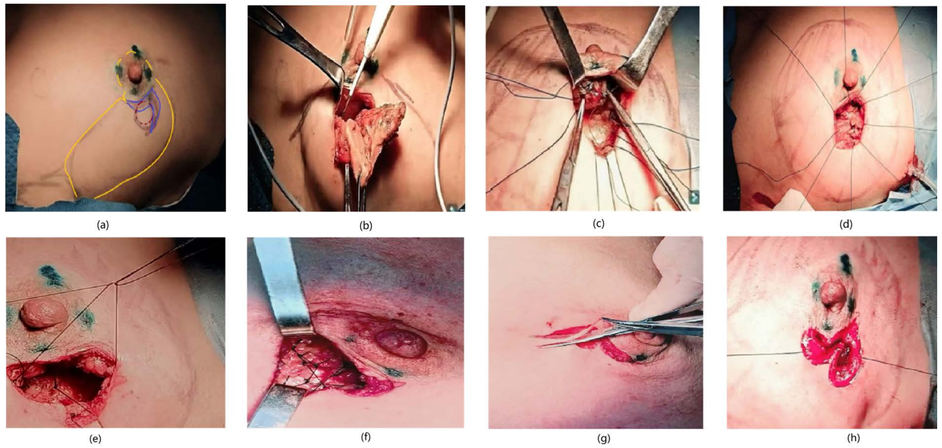
- Harris good/excellent: 81.6%
- BREAST-Q >80 points: 86.7%
- "Very satisfied" at 12 months: 78.3%

Conclusion

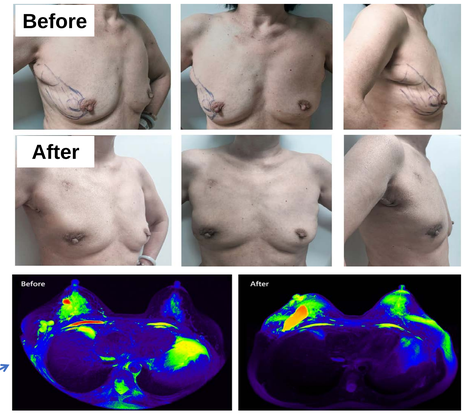
PCRT promotes **cavity-wall thickening and fibrosis ("wall-first stabilization"),** showing potential to maintain breast contour in patients with ≥50% volume loss, particularly when subcutaneous fat thickness above the cavity exceeds 1 cm. As a no-implant, low-morbidity reconstructive option, PCRT may serve as an alternative to flap or implant-based approaches, although larger studies are needed to validate long-term outcomes.

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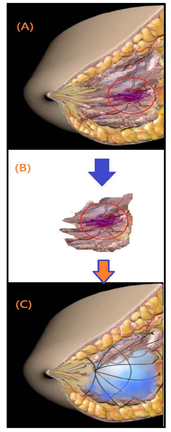
Methods & Results

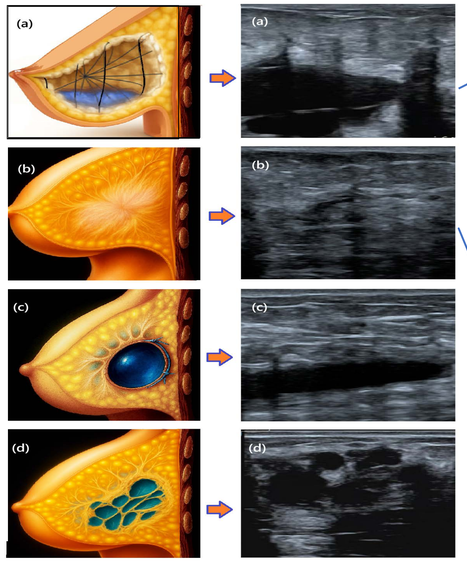


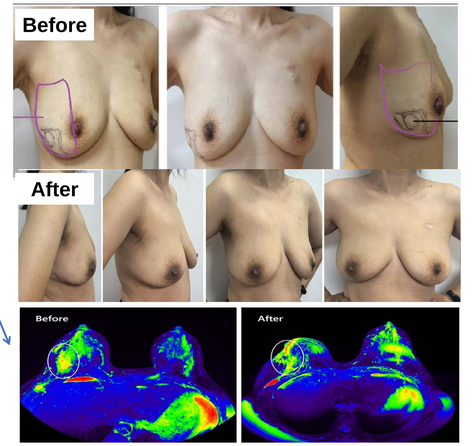
Surgical Procedure of the Postoperative Cavity Remodeling Technique (PCRT): Bird-beak incision→ Glandular excision→ 15° radial suturing→ Internal mesh support→ Mini dermo-adipofascial flap→ Subdermal insetting & layered closure



Evolution of the postoperative cavity:
AI simulation and real-world ultrasound correlation.
Panels A–D illustrate AI-generated structural models of residual cavity evolution after tumor removal, each paired with the corresponding real ultrasound appearance at the same stage.







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AACR American Association for Cancer Research