

DE-ESCALATING SURGERY OF THE BREAST AND AXILLA AFTER NEOADJUVANT CHEMOTHERAPY



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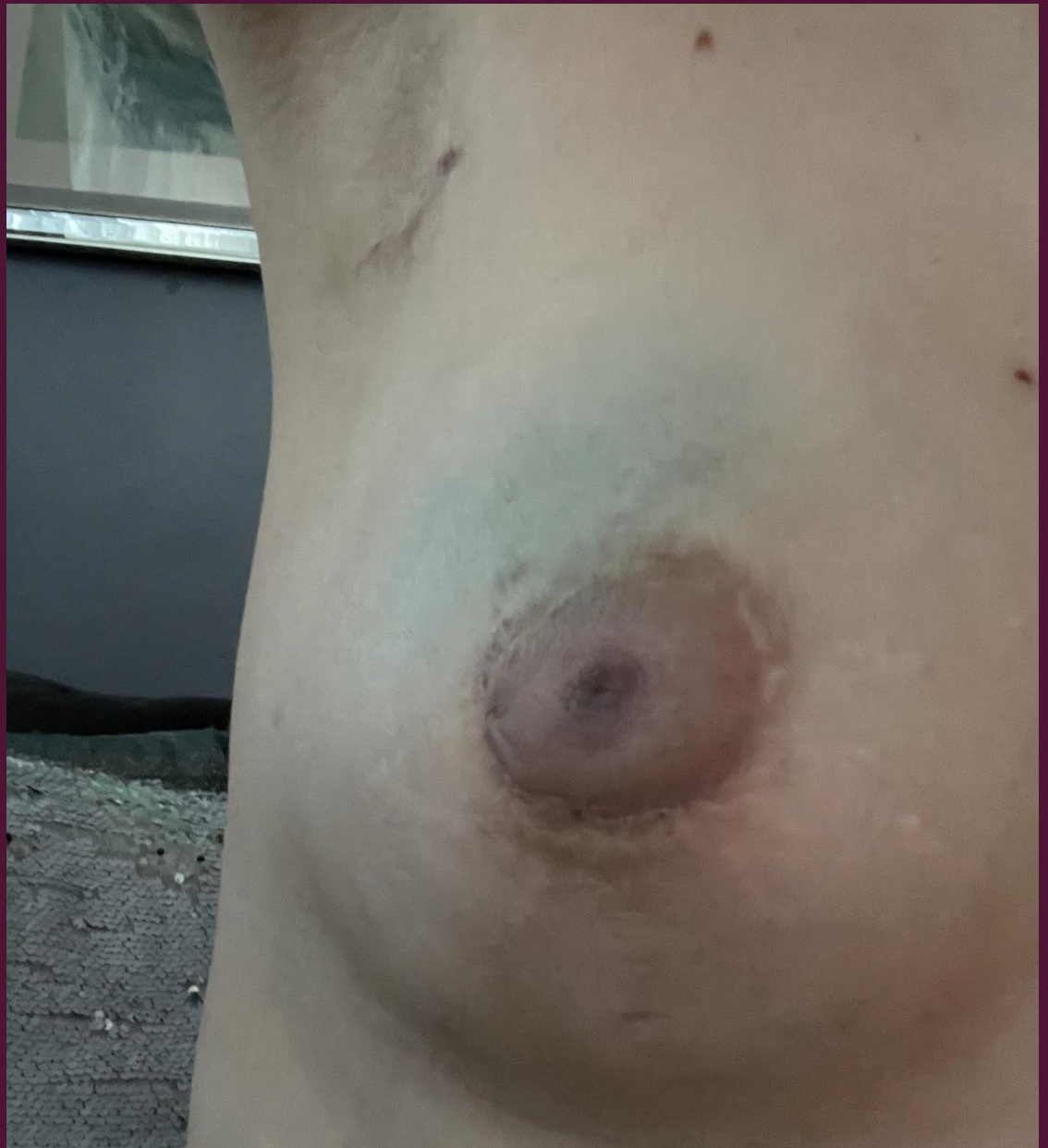
CLINICAL LEAD, DIRECTOR OF WHIPPS CROSS FRCS EXIT EXAM COURSE

COLLEGE TUTOR, ROYAL COLLEGE OF SURGEONS OF ENGLAND

CONCEPT OF HALSTED MASTECTOMY 1890



BREAST
CONSERVING
SURGERY.
1970



CURRENT EVIDENCE ?



• WHY DE-ESCALATION MATTERS:

- - Reducing unnecessary surgical morbidity while ensuring oncologic control.
- - Advances in imaging, pathology, and systemic therapies allow safer de-escalation.
- - Minimizing psychological and physical burden on patients.

Neoadjuvant chemotherapy (NAC) has transformed breast cancer treatment, increasing BCS eligibility.

NEOADJUVANT CHEMOTHERAPY (NAC) OVERVIEW

■ • **Indications:**

- - Locally advanced, inflammatory, and high-risk early-stage breast cancers.
- - HER2+ and triple-negative breast cancer (TNBC) subtypes show highest response rates.

■ • **Benefits:**

- - Tumor downstaging, increasing BCS rates.
- - Enables early assessment of treatment response.
- - May improve overall survival and disease-free survival.


IMPACT OF NAC ON TUMOR BIOLOGY

- • Tumor shrinkage can facilitate less extensive surgery.
- • Pathologic complete response (pCR) is associated with improved prognosis.
- • NAC may eliminate micrometastatic disease before surgery, reducing recurrence risk.




SURGICAL DE-ESCALATION CONCEPT

- Shift from radical mastectomy to breast-conserving and minimally invasive approaches.



- Patient selection based on tumor biology and NAC response.



- Emerging role of active surveillance in exceptional responders.

CRITERIA FOR BREAST-CONSERVING SURGERY (BCS) POST-NAC

Imaging modalities:

- - MRI, ultrasound, and mammography assess tumor response and residual disease.
- - Residual calcifications may indicate incomplete response.

Key criteria:

- - Sufficient tumor shrinkage with negative margins.
- - No extensive multifocal/multicentric disease.
- - Patient preference and ability to tolerate radiotherapy.

PATHOLOGIC COMPLETE RESPONSE (PCR) AND ITS IMPLICATIONS

- • Definition: No residual invasive cancer in breast or axilla (ypT0/Tis, ypN0).
- • Clinical significance:
 - - Strong predictor of long-term survival, particularly in TNBC and HER2+.
 - - Can justify avoiding further aggressive surgery.

FNRS (FALSE NEGATIVE RATES) OF TUMOR BED BIOPSIES AFTER NAC REPORTED IN FOUR PROSPECTIVE TRIALS

Study	N	Eligibility	Biopsy needle gauge	FNR (95% CI)
RESPONDER TRIAL (Germany) (41)	398	Partial/complete response to NST	7–10 gauge	17.8% (12.8–23.7%)
MD Anderson/Royal Marsden/SNUH (42)	166	Partial/complete response to NAC	7–14 gauge	18.7% (10.6–29.3%)
NRG BR005 (40)	98	Partial/complete response to NAC	Not reported	50% (32.9–67.1%)
MICRA Trial (43)	167	Partial/complete response to NST	14 gauge	37% (27–49%)

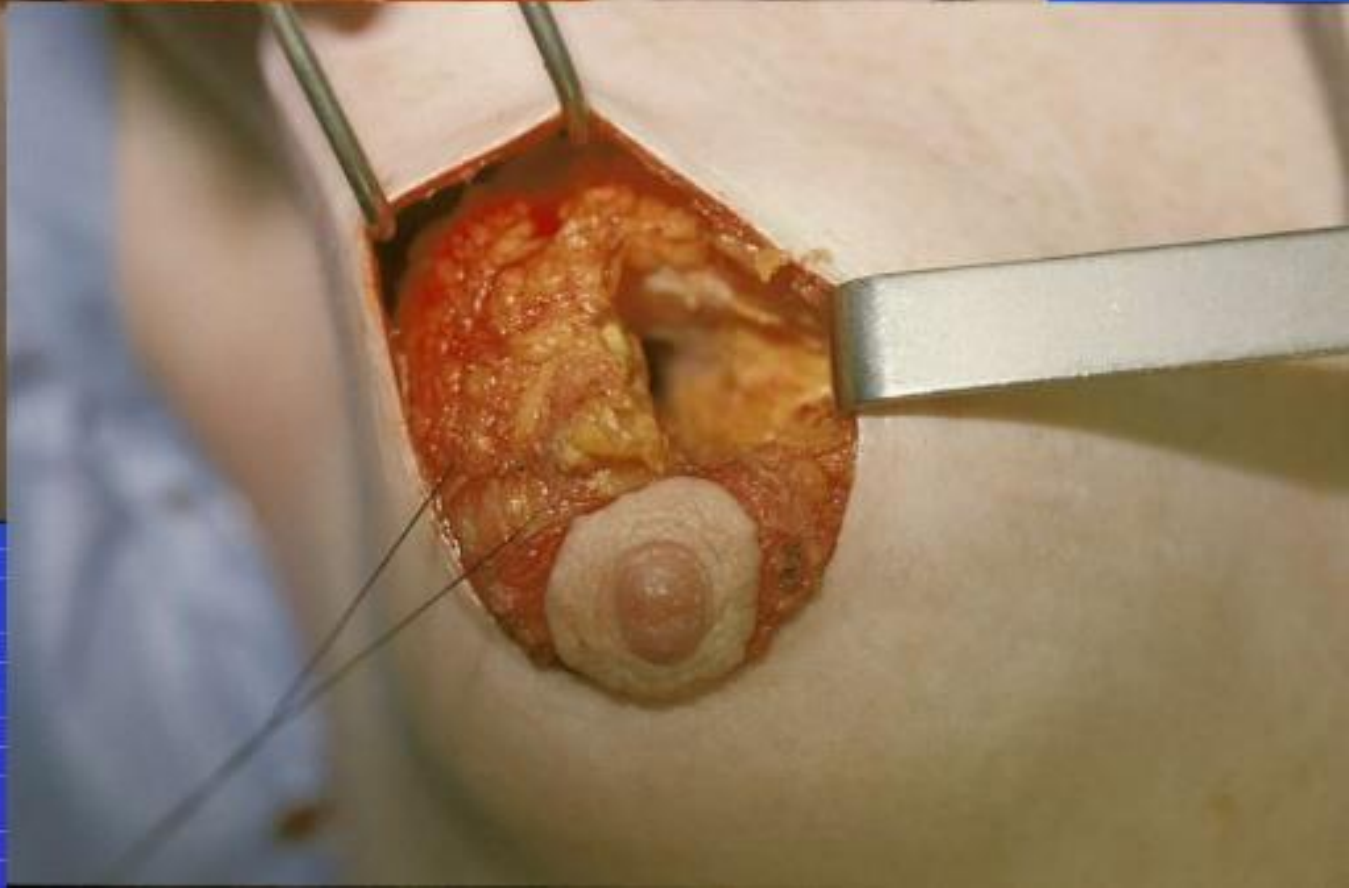
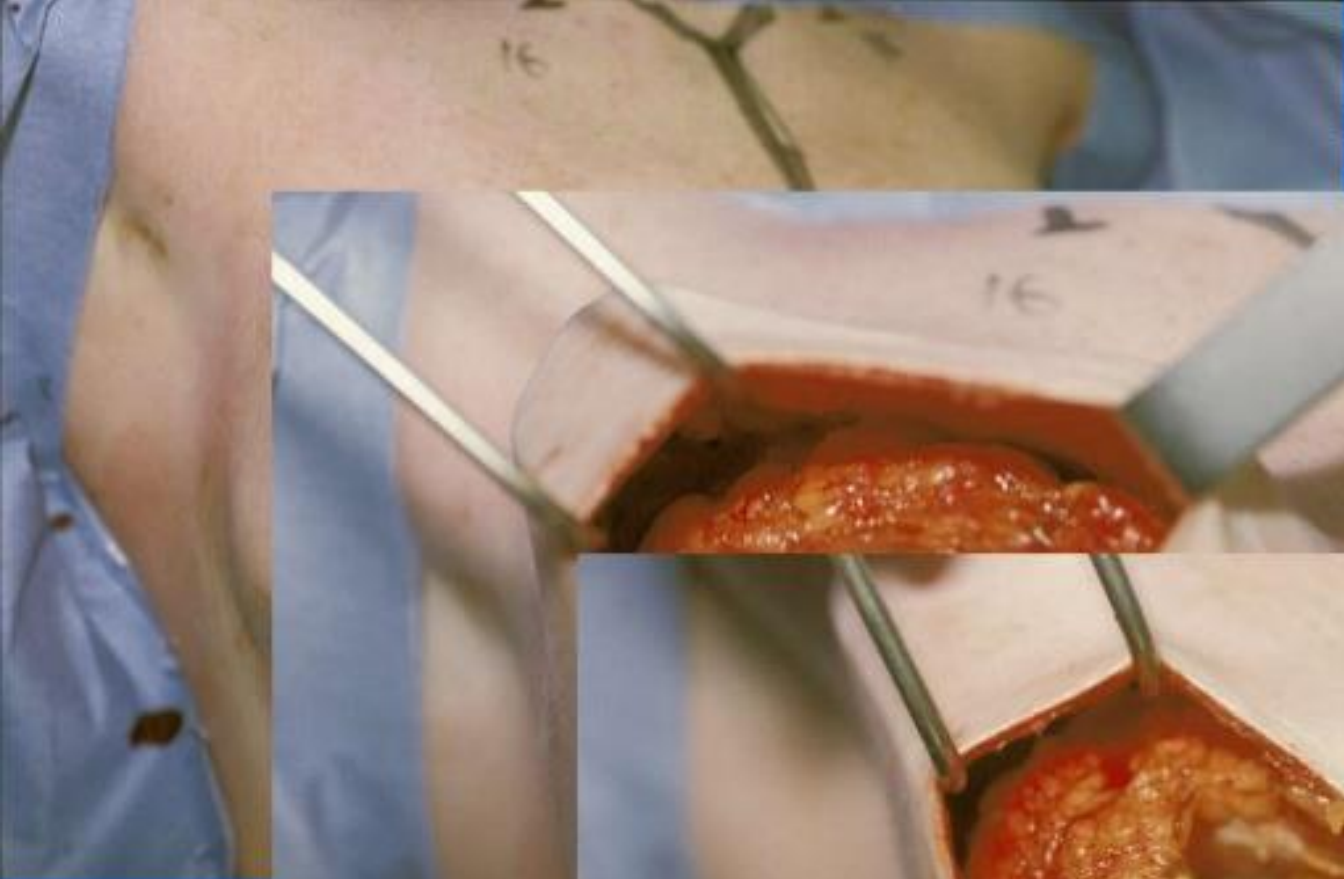
TECHNIQUES FOR BREAST CONSERVATION POST-NAC

- • Oncoplastic techniques improve cosmetic outcomes.
- • Volume displacement and replacement techniques accommodate larger resections.
- • Partial mastectomy with reshaping offers better long-term aesthetics.

Oncoplastic BCS meta-analysis

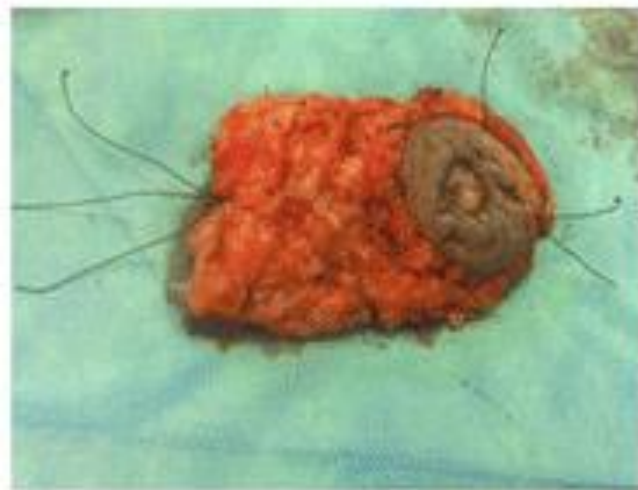
Range of mean / median FU 1 to 60 months

- 21 studies 1171 patients volume displacement \longrightarrow LR Up to 10.8%
- 15 studies 707 patients volume replacement \longrightarrow Up to 8%



Benelli L. A New Periareolar Mammoplasty: The 'Round Block' Technique. Aesth Plast Surg. 1990. 14:93-100.





Galimberti V, Zurrada S, Zanini V, Callegari M, Veronesi P, Catania S, Luini A, Greco M, Grisotti M. Central small size breast cancer: how to overcome the problem of nipple and areola involvement. *EJ Cancer*. 1993;29:1093–1096.

AVOIDING UNNECESSARY MASTECTOMY

- • NAC allows conversion from planned mastectomy to BCS in many cases.
- • Careful preoperative planning ensures adequate margins.
- • Consider role of MRI for post-NAC assessment in borderline cases.

AXILLARY SURGERY: HISTORICAL APPROACH VS. MODERN TRENDS

- • Traditional standard: Complete axillary lymph node dissection (ALND) for node-positive disease.
- • Modern trend: Sentinel lymph node biopsy (SLNB) post-NAC to reduce morbidity.

■ Axillary Surgery and Lymphoedema



SLNB AFTER NAC IN CLINICALLY NODE-POSITIVE PATIENTS

Can be performed if patient converts from cN+ to cN0 post-NAC.

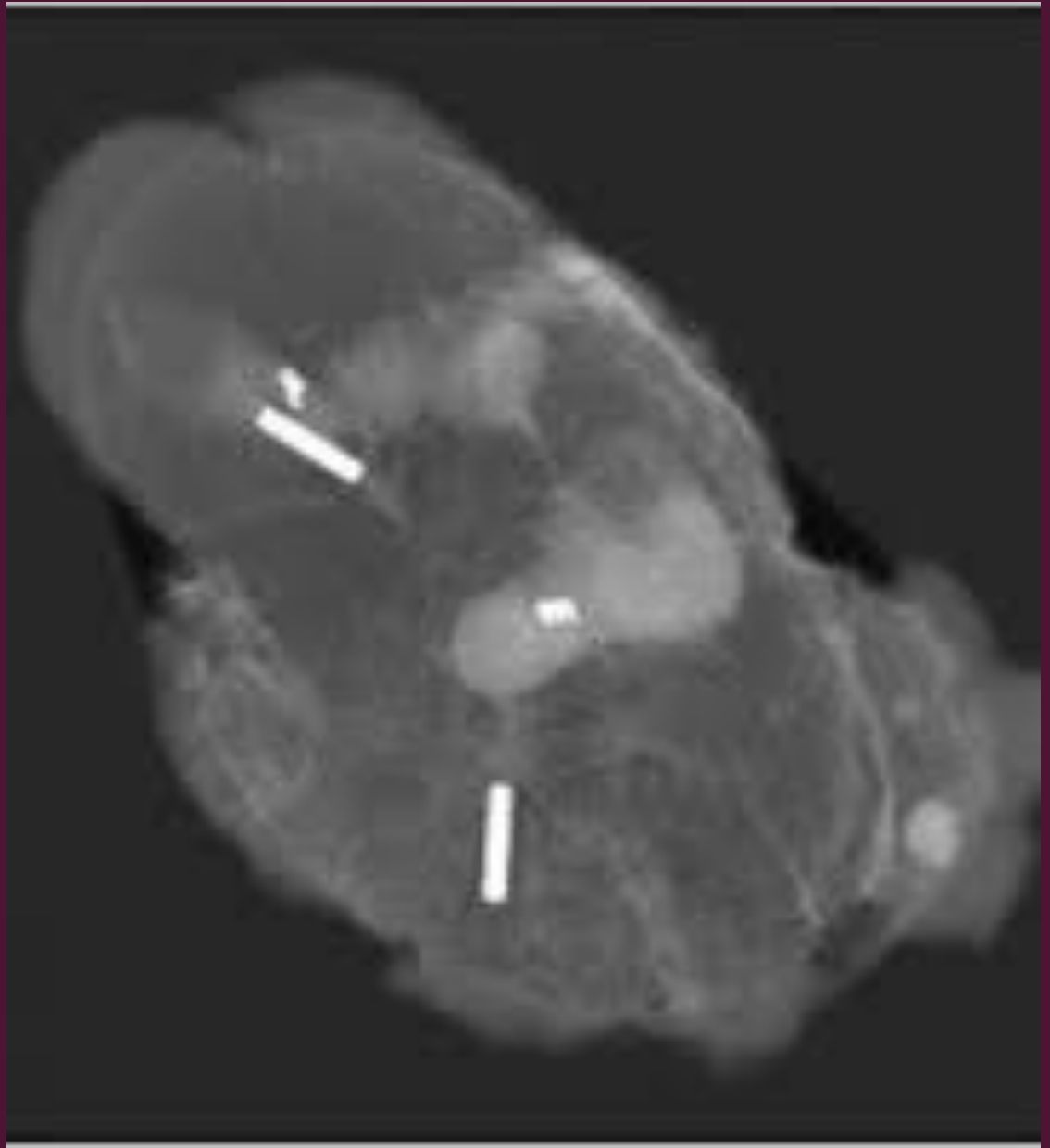
False-negative rates:

- - Improved with dual tracer and removal of at least 3 sentinel nodes.
- - Targeted axillary dissection (TAD) reduces false negatives.

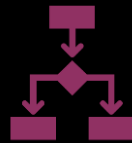
TARGETED AXILLARY DISSECTION (TAD)

- • Combines SLNB with retrieval of previously biopsied positive node (marked with clip before NAC).
- • Improves accuracy of nodal assessment post-NAC.
- • Recommended in cases where SLNB alone may be insufficient.

TAD (TARGETED AXILLARY DISSECTION)



DE- ESCALATING AXILLARY SURGERY IN PCR CASES



- Z0011 trial: SLNB alone is sufficient in certain cases.



- AMAROS trial: Radiation therapy as an alternative to ALND.



- Modern guidelines now recommend omitting ALND in pCR patients.

RADIOTHERAPY AS A SUBSTITUTE FOR SURGERY



- Regional nodal irradiation may control microscopic residual disease.



- AMAROS and other trials show comparable outcomes to ALND in some settings.



- Important consideration in treatment de-escalation.

MOLECULAR AND GENOMIC BIOMARKERS FOR DE-ESCALATION

- Gene expression profiling (e.g., Oncotype DX, MammaPrint) may refine selection for de-escalation.

- HER2+, TNBC patients have higher NAC response rates, making de-escalation feasible.

- Ongoing studies are evaluating biomarkers to predict nodal pCR.

PATIENT SELECTION FOR SURGICAL DE-ESCALATION

- Tumor subtype (HER2+, TNBC more likely to achieve pCR).
- Imaging response.
- Patient preference and shared decision-making.

Importance of a multidisciplinary team approach.

CHALLENGES AND CONTROVERSIES



- Risk of under-treatment vs. over-treatment.



- Variability in NAC response and difficulty in accurately assessing pCR preoperatively.



- Long-term oncologic outcomes of de-escalation strategies remain under study.

ONGOING AND FUTURE CLINICAL TRIALS

- RESPONDER trial: Evaluating further de-escalation of breast and axillary surgery.
- SOUND trial: Investigating omission of SLNB in pN0 patients.
- Role of AI in improving radiologic prediction of pCR.

SUMMARY AND TAKEAWAYS

- NAC enables safe de-escalation in selected patients.
- pCR is a key determinant for reducing surgical extent.
- Clinical trials support omitting ALND in pCR cases.