

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



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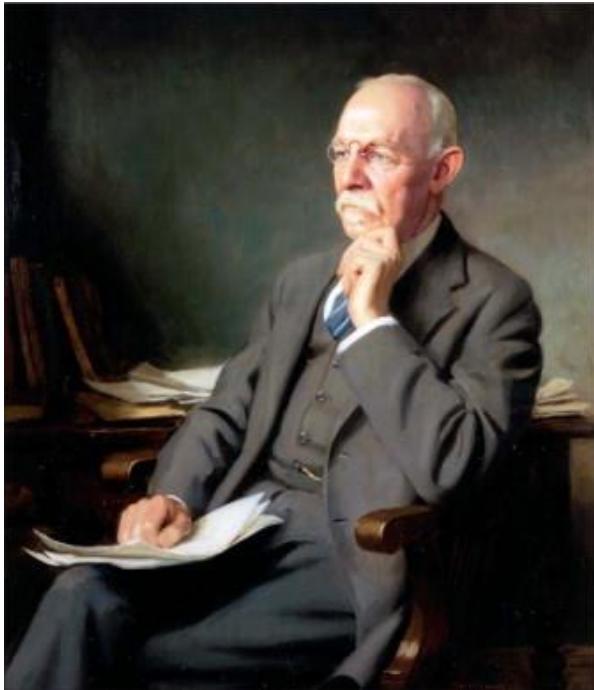
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HONORARY SENIOR LECTURER, QUEEN MARY'S UNIVERSITY OF LONDON

CLINICAL LEAD, DIRECTOR OF WHIPPS CROSS FRCS EXIT EXAM COURSE

COLLEGE TUTOR, ROYAL COLLEGE OF SURGEONS OF ENGLAND

CONCEPT OF HALSTED MASTECTOMY 1890

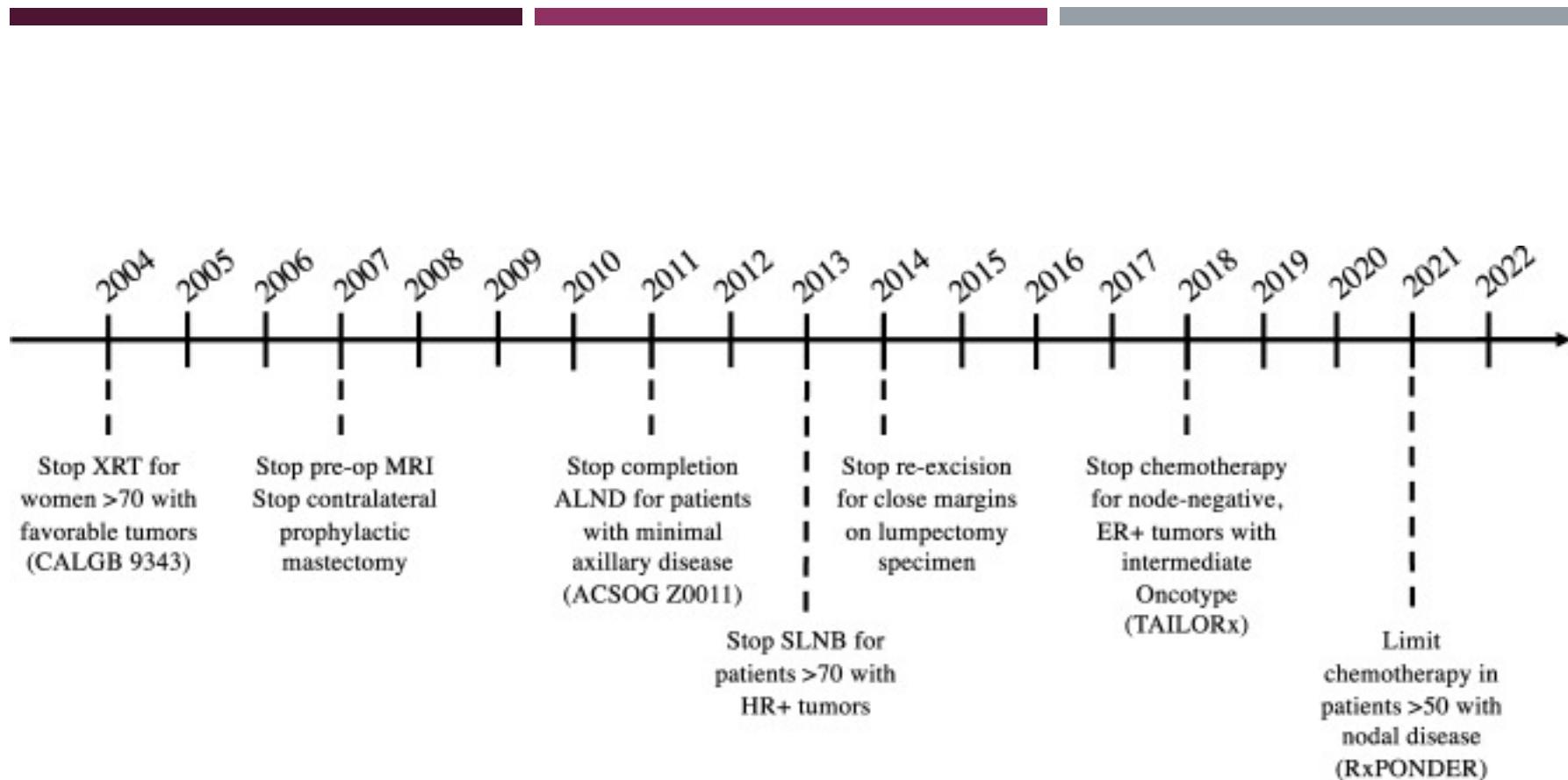


BREAST
CONSERVING SURGERY.
1970





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%)

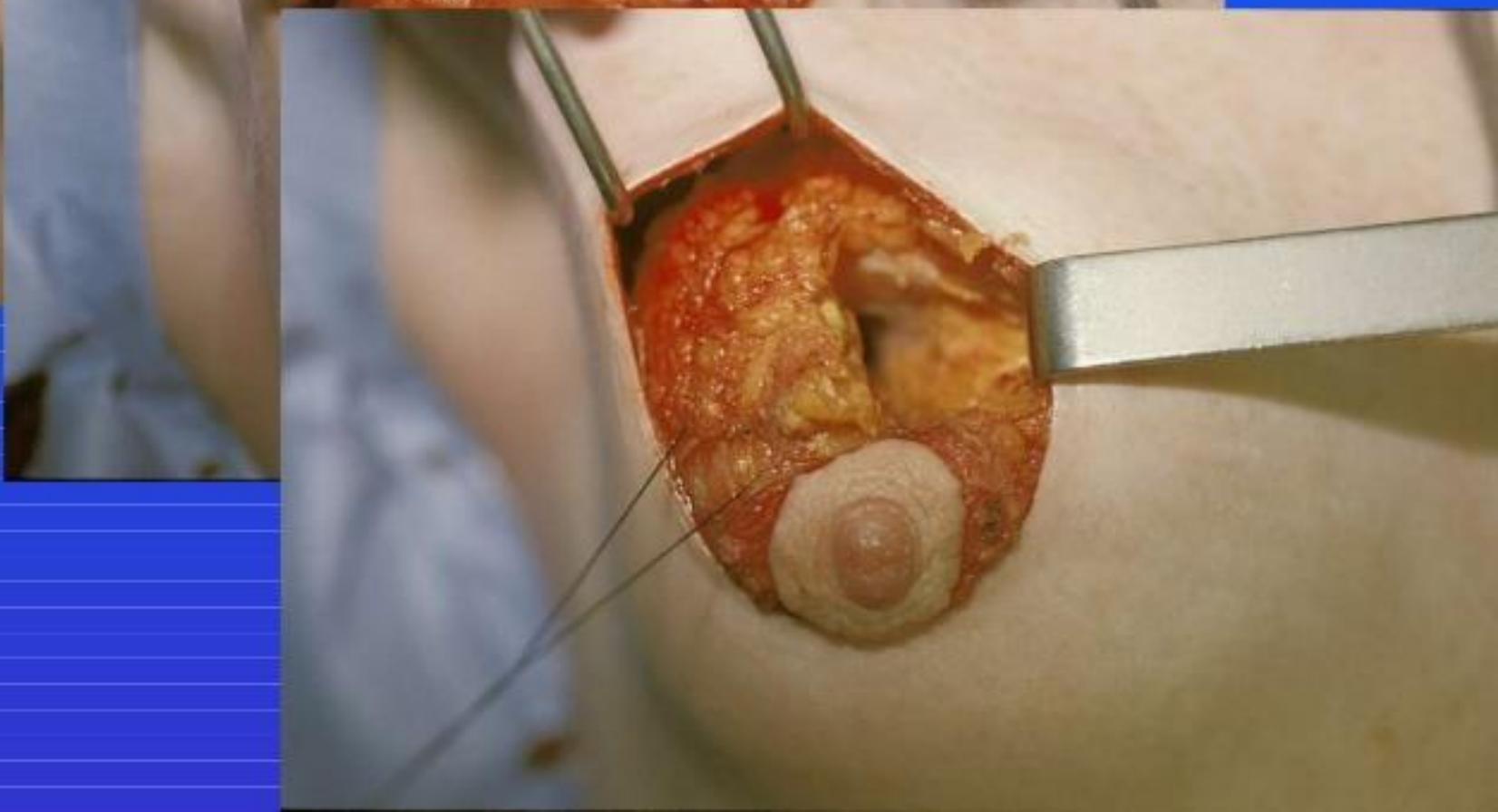
TECHNIQUES FOR BREAST CONSERVATION POST-NAC

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

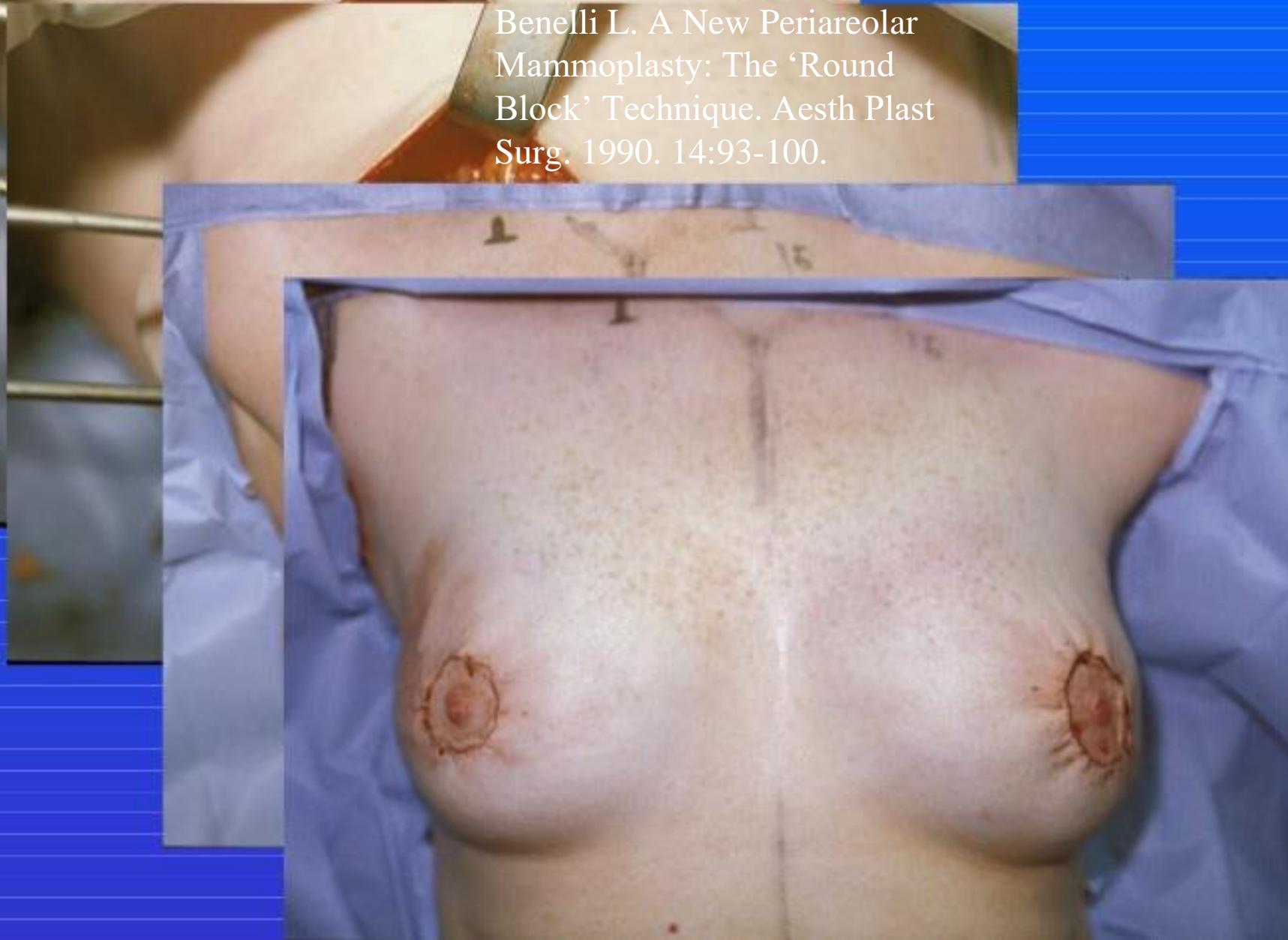
Oncoplastic BCS meta-analysis

Range of mean / median FU 1 to 60 months

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



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





Galimberti V, Zurruda 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.

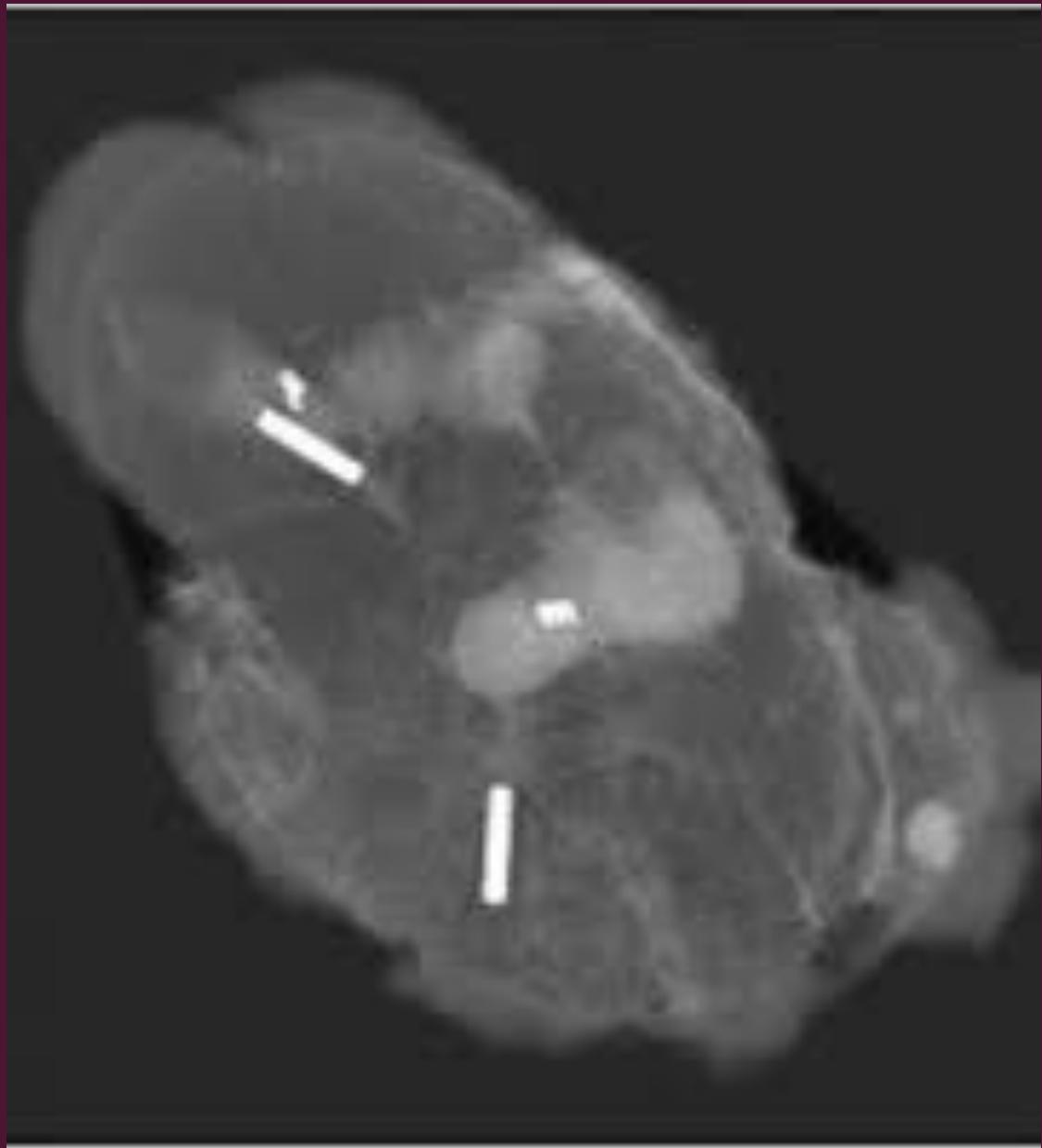
False-negative rates:

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

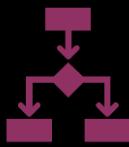
TARGETED AXILLARY DISSECTION (TAD)

- • 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.

RADIODERAPY 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.