Contrast-Enhanced Mammography in Monitoring Response to Chemotherapy

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Introduction

- Breast cancer remains one of the most commonly diagnosed cancers among women globally.
- Neoadjuvant chemotherapy (NACT) is given prior to breast surgery to shrink tumors and improve surgical outcomes.
- Monitoring treatment response is vital to ensure chemotherapy is working effectively.
- Contrast-Enhanced Mammography (CEM) has emerged as an accessible, detailed imaging solution for monitoring chemotherapy.

Procedure Details

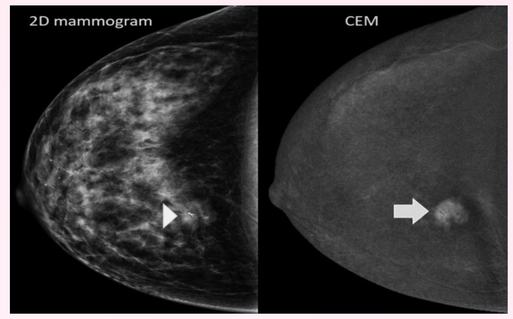
- CEM uses an IV iodinated contrast agent paired with standard mammography positioning.
- IV catheter is placed in the patient's arm/hand for contrast delivery.
- Dye highlights areas of increased tumor vascularity and metabolic activity.
- Subtracts tissue background to make cancerous lesions appear bright against a dark field.
- Obtains 8 standard views during routine compression.
- Highly beneficial for dense breast tissue where standard 2D views fail.

Clinical Advantages

- Measures subtle shifts in tumor size and vascular uptake throughout treatment.
- Identifies remaining viable tumor tissue post-therapy for precise surgical planning.
- Cost effective: significantly cheaper than breast MRI while utilizing existing equipment.
- Accessible: ideal for patients unable to undergo MRI (claustrophobia, metal implants).
- Higher sensitivity to small tumors with fewer false-positive results.

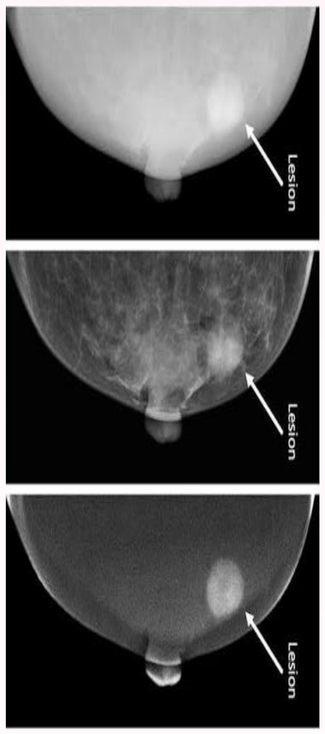
Conclusion

- CEM represents a major advancement by providing both structural and functional tumor data.
- Detects response to neoadjuvant chemotherapy earlier than conventional imaging modalities.
- Increases diagnostic accuracy in dense breasts and reduces missed diagnoses.
- Guides timely treatment adjustments, aids in surgical planning, and improves long-term patient outcomes.



Role of NACT

- Administered before surgery for large, aggressive, or locally advanced breast tumors.
- Primary goal: shrink or completely eliminate primary tumors prior to resection.
- Enables breast-conserving surgery instead of full mastectomy in suitable patients.
- Continuous monitoring ensures therapy safety and prevents unnecessary ineffective treatments.



Limitations & Risks

- Small risk of allergic reaction to the iodinated contrast dye (minimized through screening).
- Slightly elevated radiation dose (30%-50% higher than standard 2D mammography).
- Radiation remains well within safe regulatory limits for screening and diagnosis.
- Diagnostic precision and earlier detection far outweigh minor procedural risks.

References

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