SURGERY OF BREAST CANCER

RADIOTHERAPIST'S PERSPECTIVE

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MESSAGE

- BREAST CANCER MANAGEMENT MULTIMODALITY APPROACH
- CLINICIAN, PATHOLOGIST, RADIATION ONCOLOGIST, MEDICAL ONCOLOGIST, PHYSIOTHERAPIST AND SUPPORT GROUP
- RADIOTHERPAY IS AN INTEGRAL PART OF *BCT*, HENCE RADIOTHERAPIST SHOULD JOINTLY SEE THE CASE WITH SURGEON TO CONSIDER FOR VARIOUS MODALITIES OF *PBI* OR *WBI*

Surgical Management of Breast Cancer

Issues

1. **Detection**
   Screen detected- Non palpable
   Patient detected- Palpable
   Incidental finding during check up for other causes

2. **Three way confirmation**
   Imaging
   Clinical
   Pathology

3. **Biopsy**
   FNAB
   Core
   Excisonal

Screen detected Malignancy

- **Very small tumour**: IDC
- **Clustered microcalcifications**: DCIS (local or diffuse)
- **Incidental LCIS, DCIS or ADH** on some surgery

- **Localised DCIS-** Wide excision-specimen mammography ± radiotherapy ± hormone therapy
- **Diffuse DCIS-** MRM+Radiotherapy ± hormone therapy
- **IDC-** BCT/Mastectomy + sentinal node biopsy ± ALND

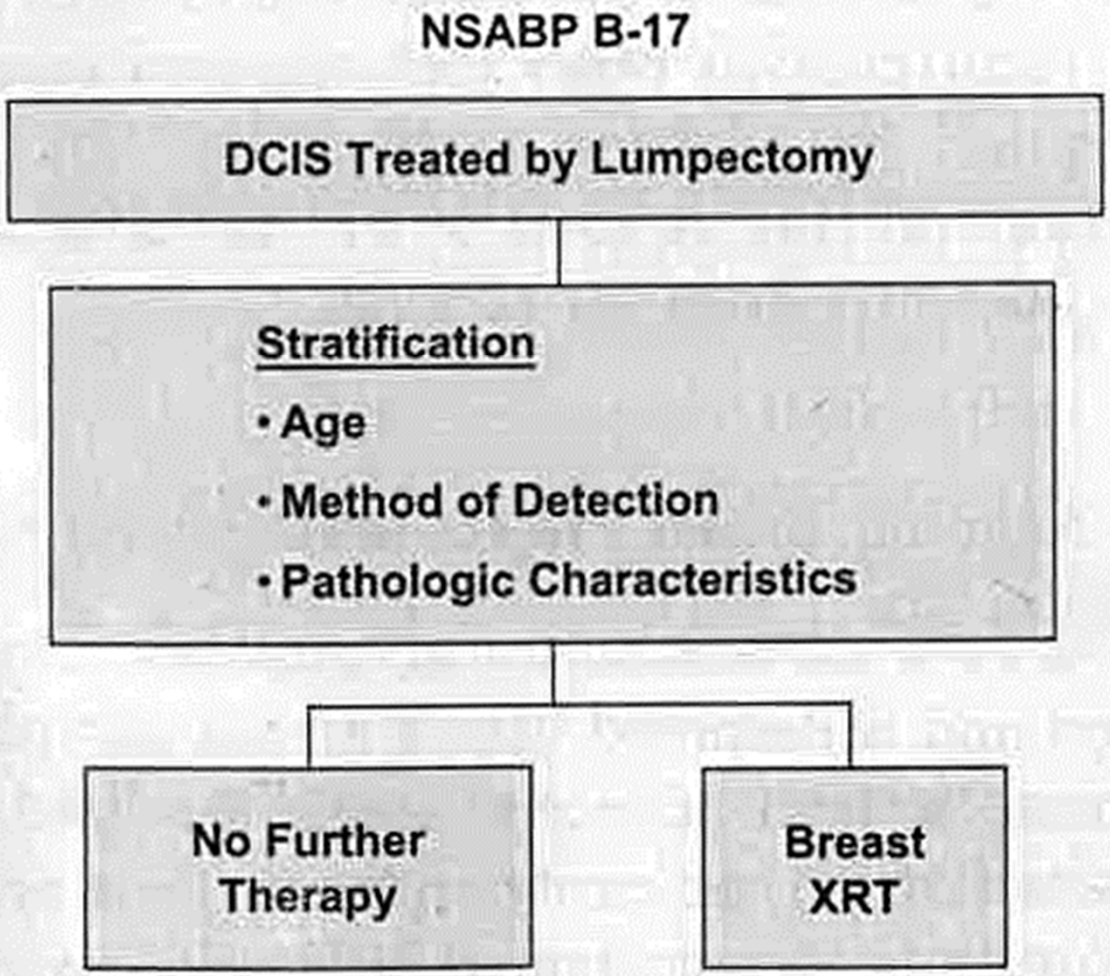


Fig. 2. Randomization schema for NSABP Protocol 17.

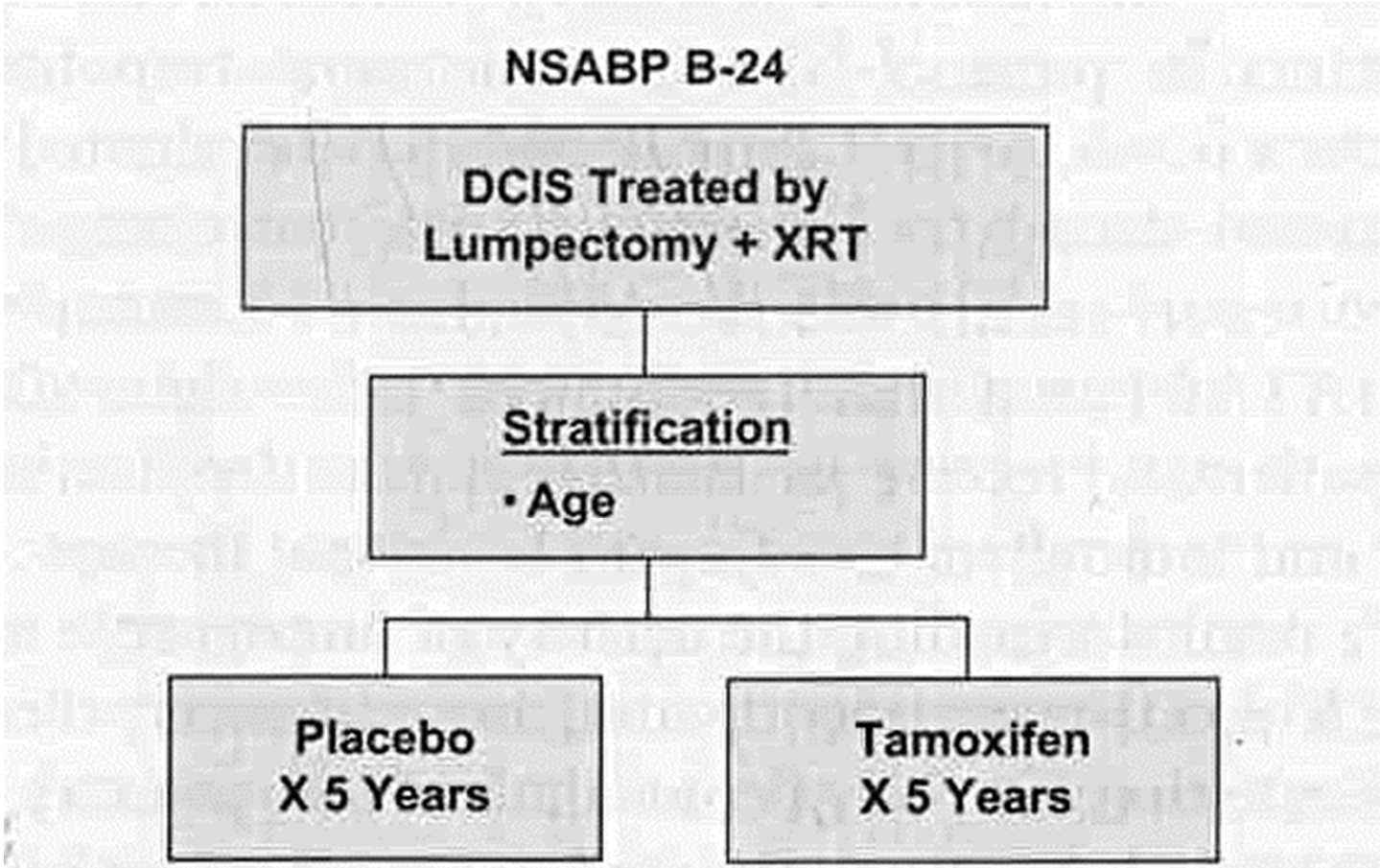


Fig. 3. Randomization schema for NSABP Protocol 24.

Box 1. Indications for mastectomy in ductal carcinoma in situ

Absolute indications

Women with two or more primary tumors in the breast

Diffuse malignant-appearing calcifications

Persistent positive margins after reasonable surgical attempts

Inability to give radiation when needed for local control because of a history of prior breast irradiation or active systemic lupus erythematosus

Patient choice

Relative indications

Extensive DCIS that can only be removed with a small negative margin, particularly in a young woman

Tumor size to breast size ratio would result in a poor cosmetic result

Pregnancy—the long natural history of DCIS suggests that for some women, excision during pregnancy and with radiation delivered post-partum may be reasonable. In the absence of definitive data, such decisions should be made on an individual case basis.

High Risk Women-Risk Reduction Surgery

1. **Hereditary Breast-ovarion cancer families**
2. **Identified through BRCA testing**

- **Oopherectomy** reduces the breast cancer incidence by 50%
- **Bilateral prophylactic mastectomy** gives 90% reduction in breast cancer risk and mortality (Mayo clinic data)
- **No randomised trials**
- **Mayo clinic database** -639 Prophylactic mastectomies: After 14 years, 7 breast cancers were detected
- So the **protection conferred by PM is not complete** but can substantially reduce the incidence of breast cancer in high risk women.

BREAST CANCER SURGERY
AN EVOLUTION OVER LAST 50 YEARS

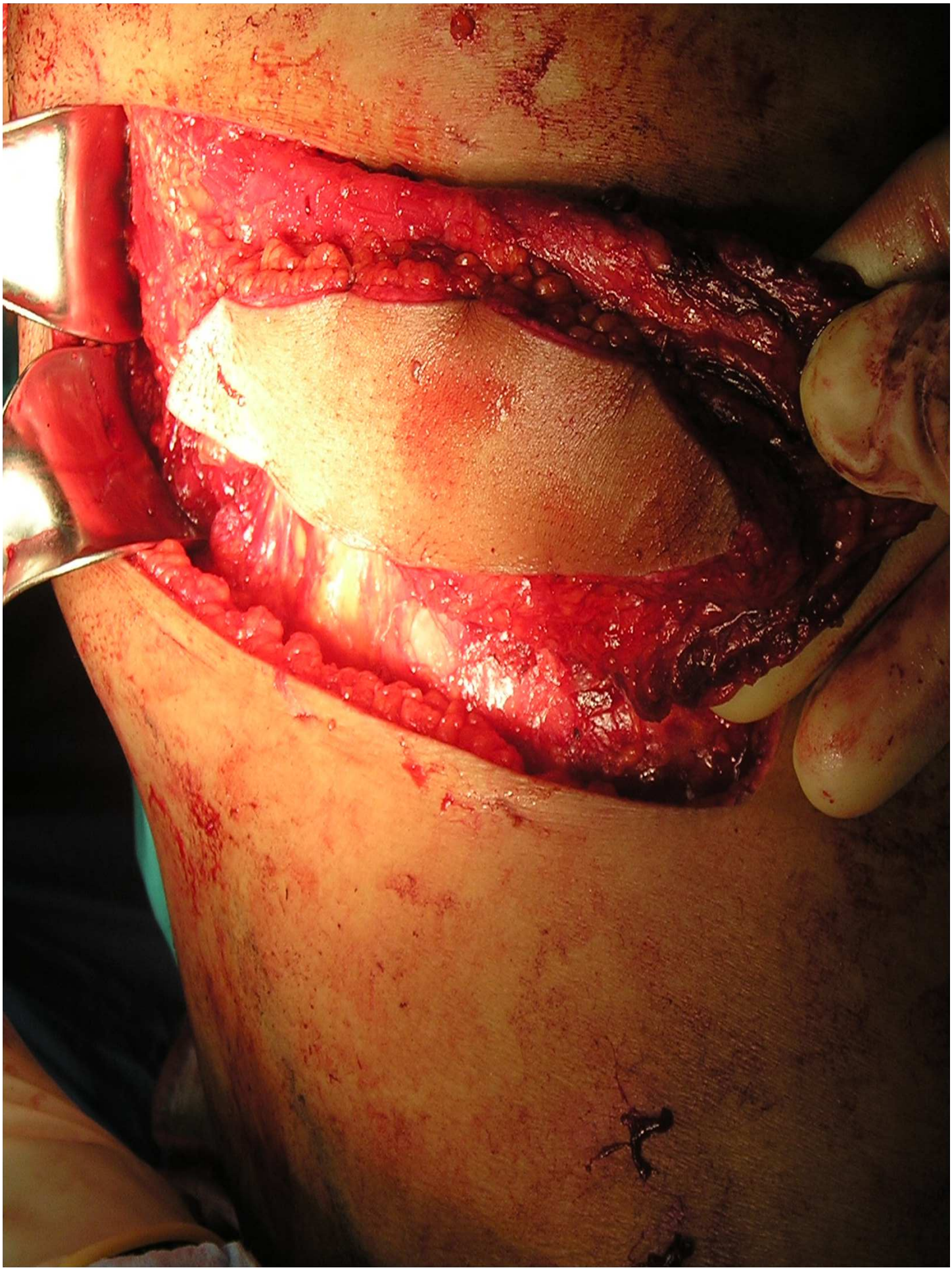
- RADICAL MASTECTOMY- HALSTEDIAN PERCEPTION
- SIMPLE MASTECOMY WITH AXILLARY RADIAION
- MODIFIED RADICAL MASTECTOMY
- BREAST CONSERVATION THERAPY- ***BCT*** i.e. WIDE EXCISION OF LUMP WITH CIRCUMFRENTIAL FREE MARGINS AND ***WBI*** OR ***PBI***

LOCO- REGIONAL RADIOTHERAPY FOR BREAST CANCER

- AIM IS TO PREVENT OR CONTROL LOCAL RECURRANCE
- POST MRM RT IN T3N2 DISEASE OR LABC
- POST LUMPECTOMY RT IN ALL CASES

PRE OPERATIVE RELEVANT CRITERIA FOR BCT

- RADIATION IS INSEPERABLE COMPONENT OF BCT, HENCE CAN BE UNDER TAKEN IF PATIENT AGREES FOR IT
- WELL DEFINED < 3 CM TUMOUR
- ADEQUATE TUMOUR TO BREAST RATIO FOR COSMESIS
- SITE OF LUMP: EXTREM MEDIAL QUADRANT OR PARASTERNAL LUMP NOT SUITABLE FOR BOOST OR PBI
- AXILLARY TAIL LUMP IN VARIABLY LEADS TO AXILLARY IRRADIATION
- HISTORY OF AUTO IMMUNE SKIN CONDITIONS OR PREVIOUS RT IS STRONG CONTRA INDICATION FOR BCT
- MULTI CENTRIC LESIONS CONTRA INDICATION




24 9:25AM

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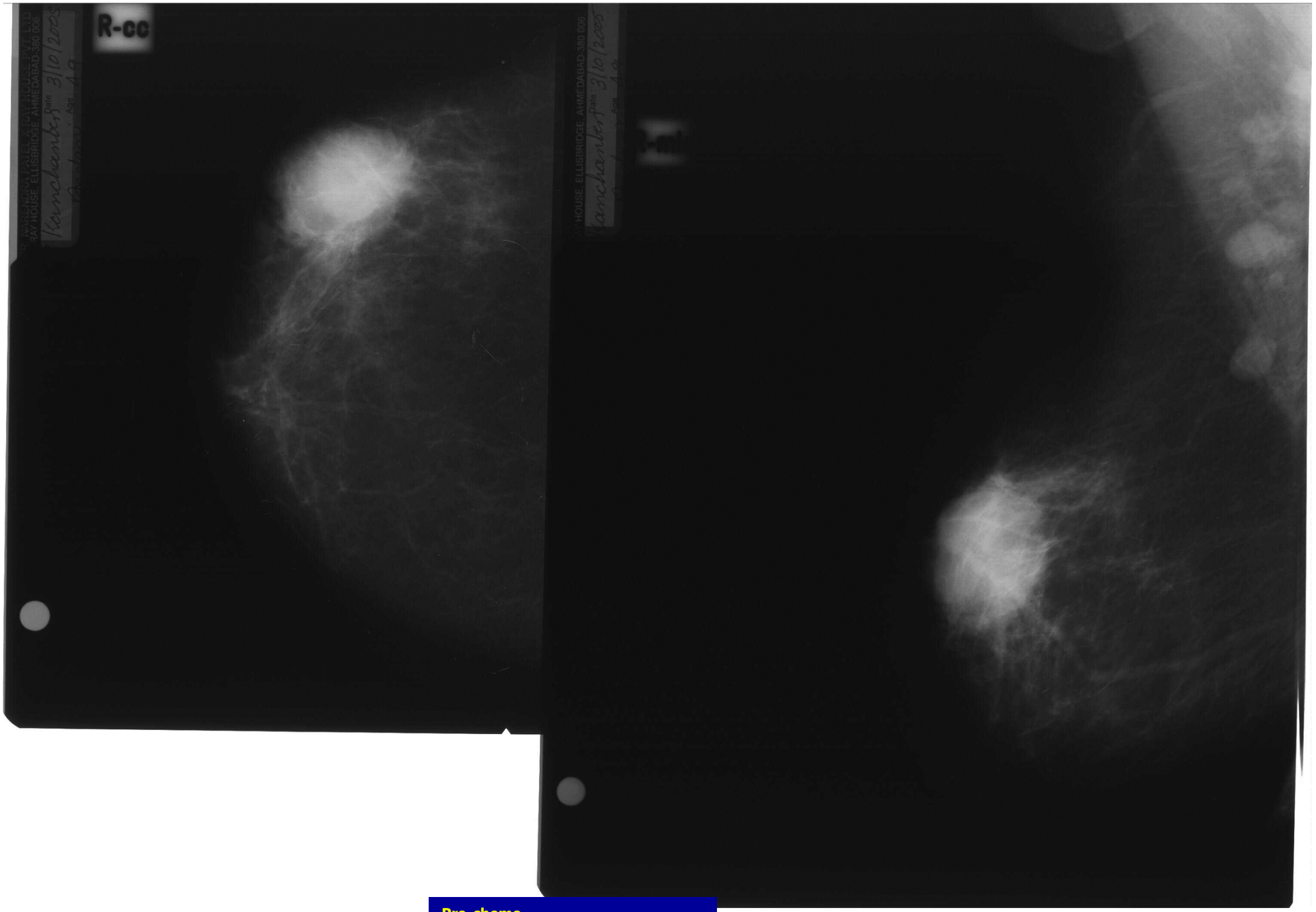
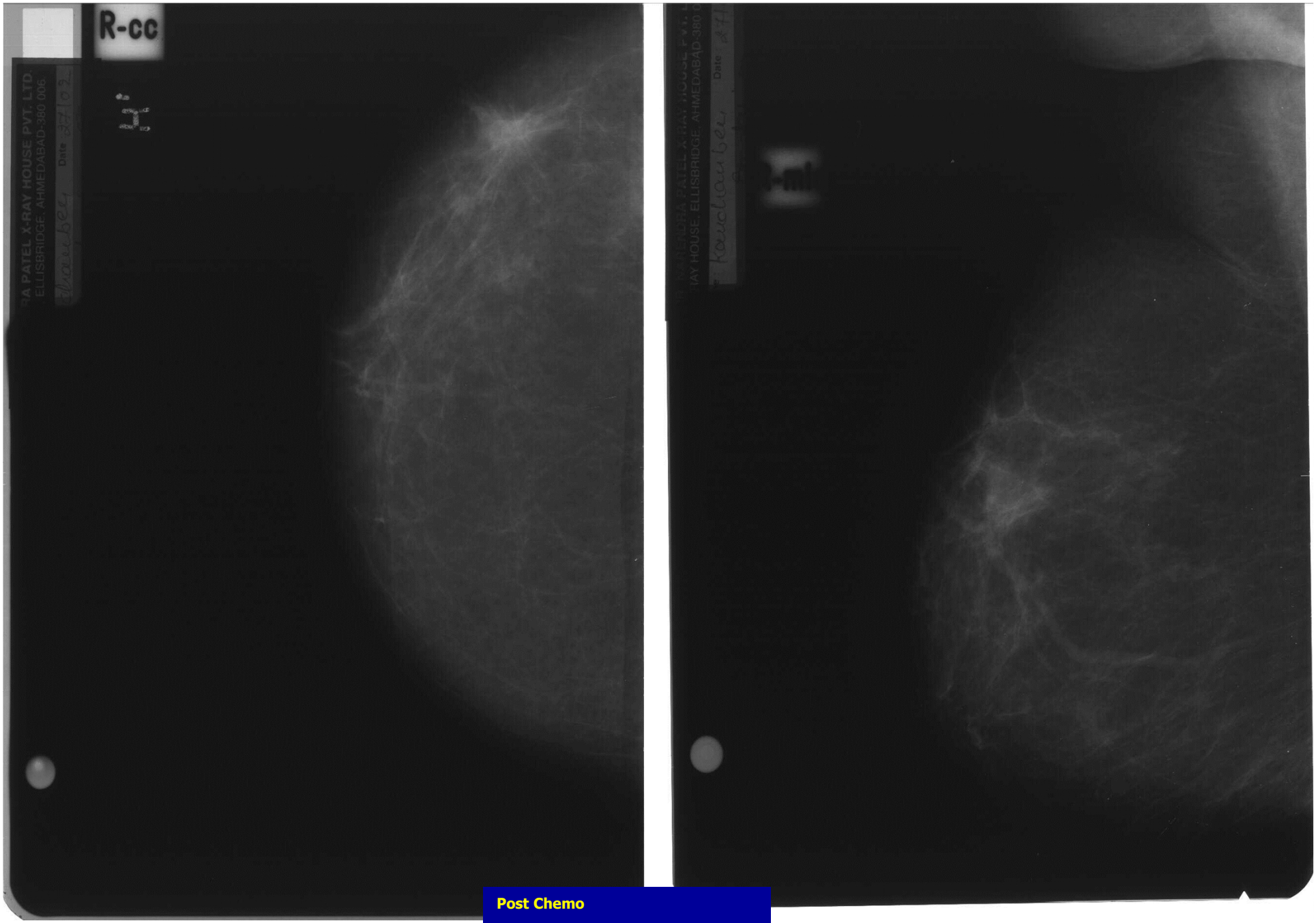
BCT AFTER NEO ADJUVANT CHEMOTHERAPY

- LABC- DUE TO SHEER LARGE SIZE OF TUMOUR > 5 CM, WELL DEFINED MARGINS, NO MULTI CENTRYCITY, NO A OR B SIGNS
- DISPROPOTIONATE BREAST : TUMOUR RATIO, i.e. SMALL VOLUME BREAST WITH > OR = 3 CM TUMOUR



Pre-chemo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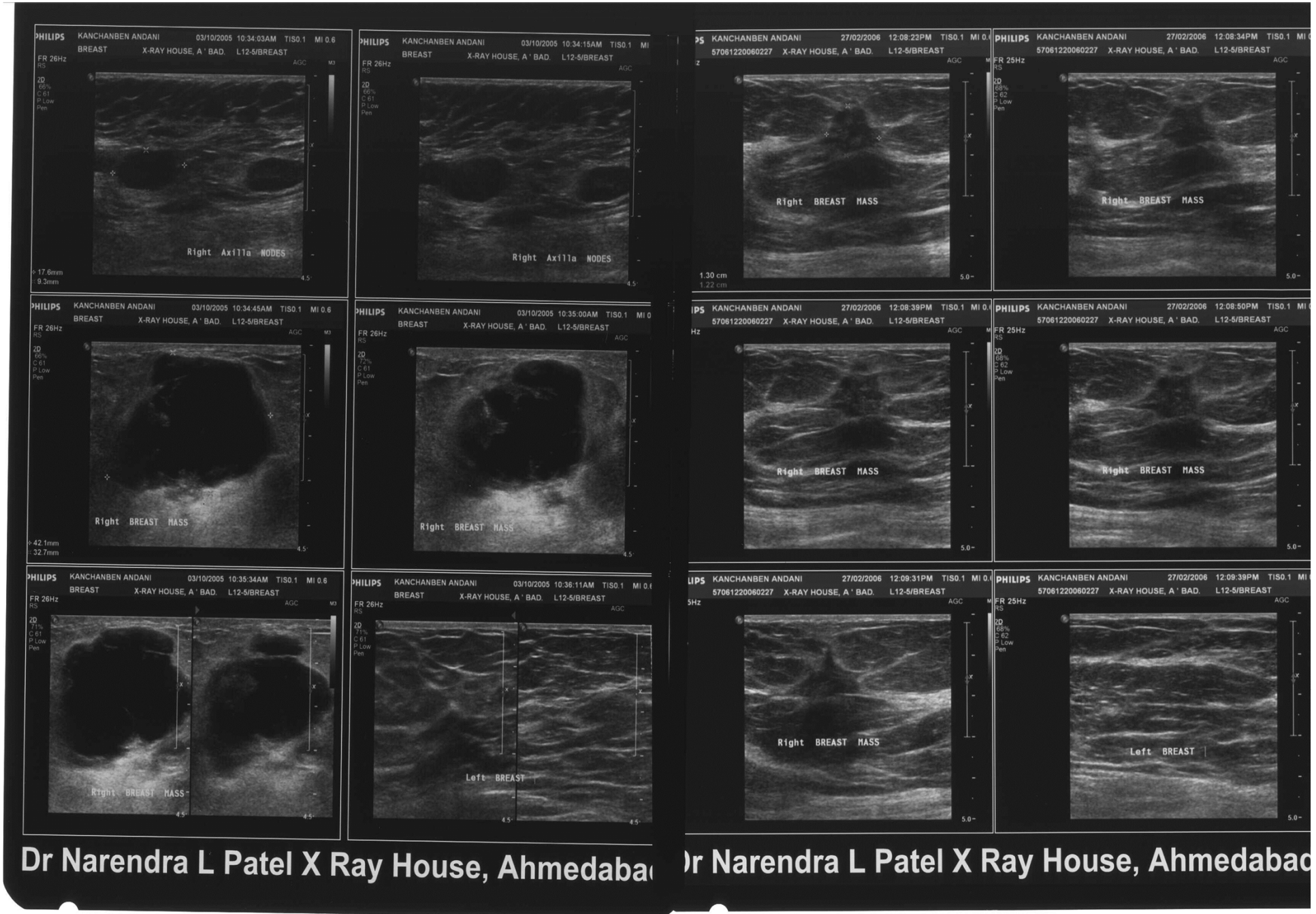
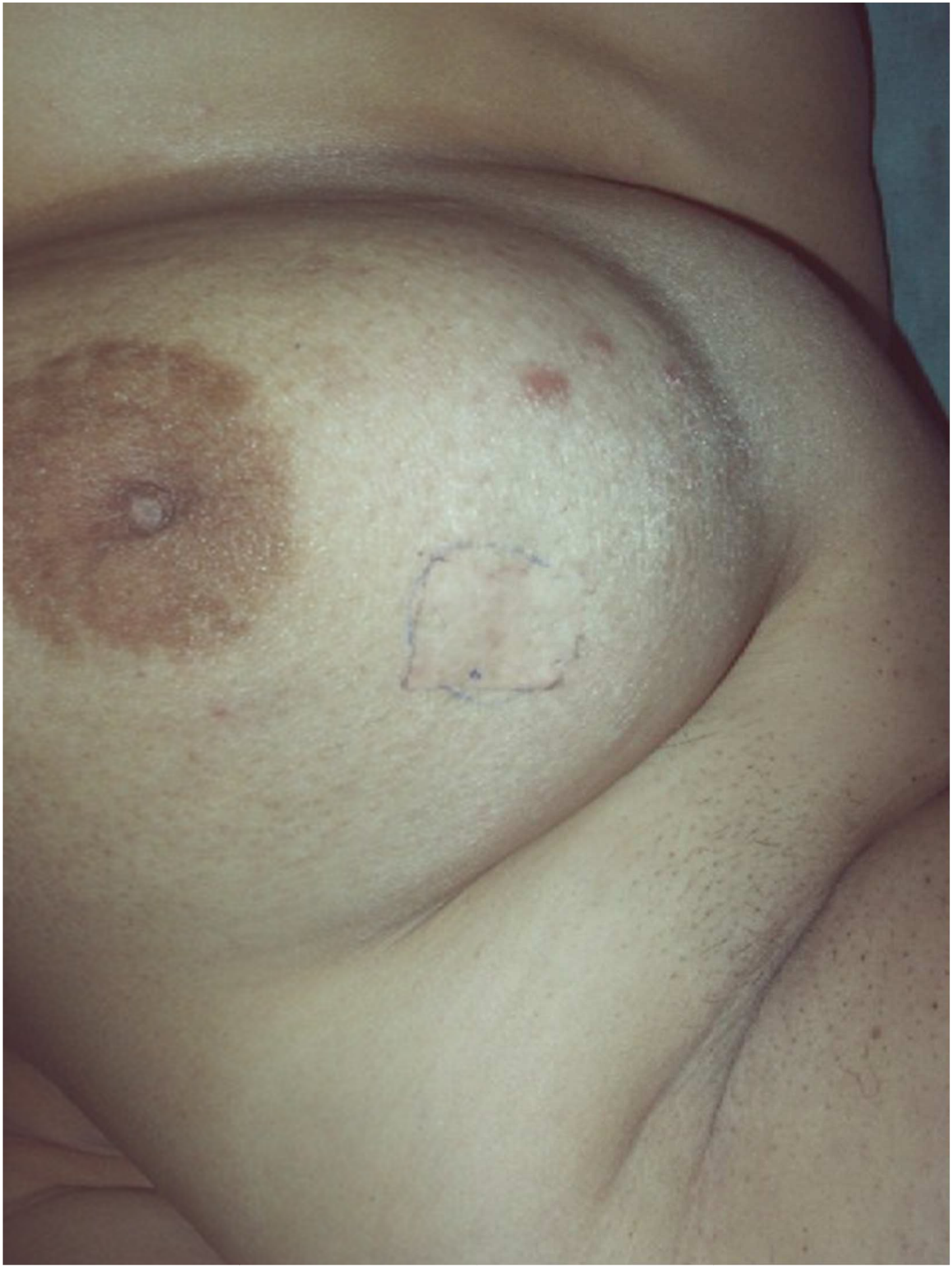
Date

Post Chemo



Pre-chemo **Post Chemo**



ROLE OF RADIOTHERPY IN BCT

- **SEGMENTAL MASTECTOMY WITH ALND I & II LEVELS WITH WBI= MRM FOR STAGE I & II BREAST CANCER**
- **NSABP O6 TRIAL**

1. **DEMONSTRATED NO DIFFERENCE IN DFS OR OS, IN PATEINTS WHO HAD PRIMARY TUMOUR UPTO 4 CM AND TREATED WITH MRM, SEGMENTAL MASTECTOMY WITH ALND OR SEGMENTAL MASTECTOMY WITH ALND AND WBI. BUT 20 YEARS FOLLOWUP REVEALED DECREASE IN LOCAL RECURRENCE FROM 39% TO 14 % WITH ADDITION OF *WBI***
2. **75% RECCURENCE ARE CLOSE TO OR WITHIN TUMOUR BED**
3. **DECREASED SURVIVAL RATES AND INCREASED METASTASIS HAS BEEN DEMONSTRATED IN CASES OF TRUE LOCAL RECURRENCE COMPARED TO NEW PRIMARY, HENCE RADIATION AFTER BCT IS ESSENTIAL FOR LOCAL CONTROL**

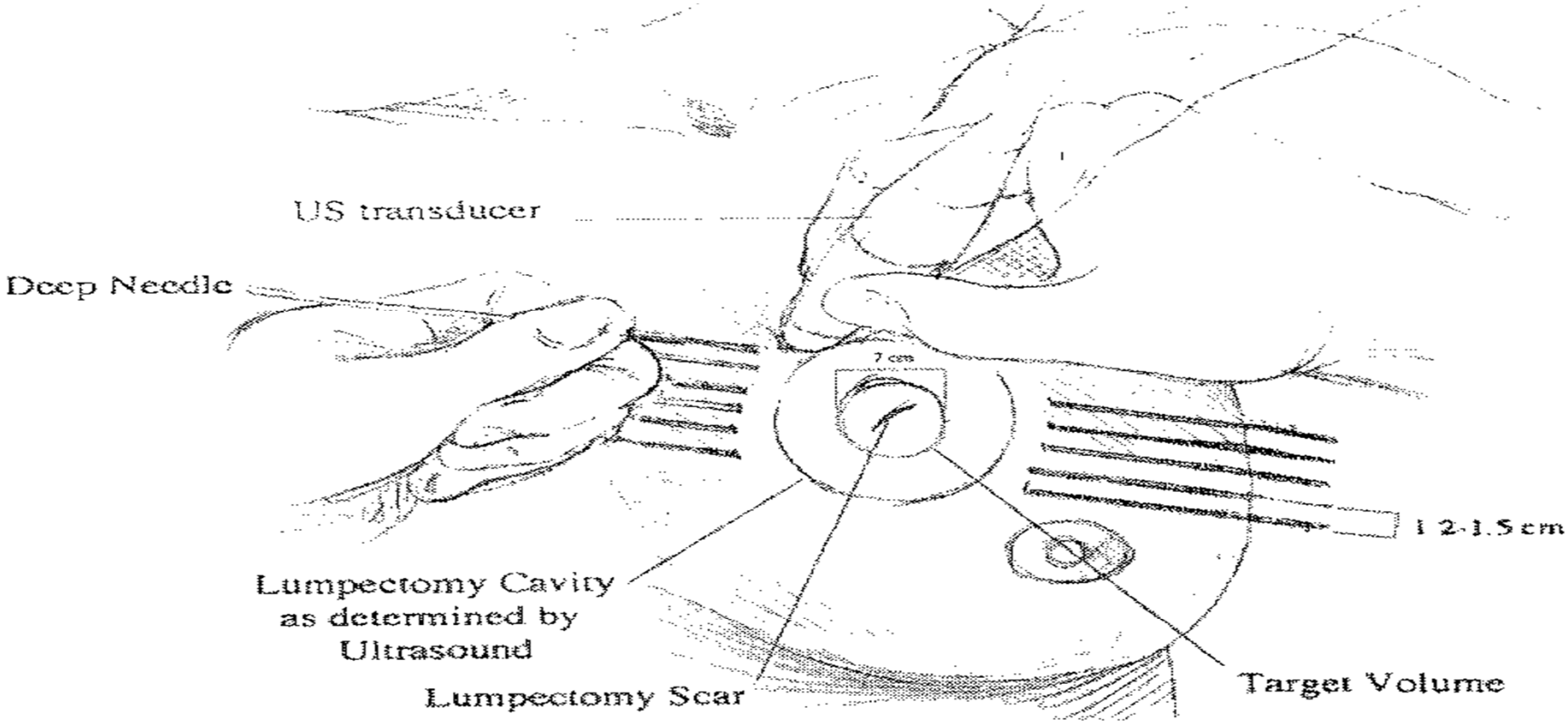
RADIATION TECHNICS FOR BCT

- WHOLE BREAST IRRADIATION- WBI

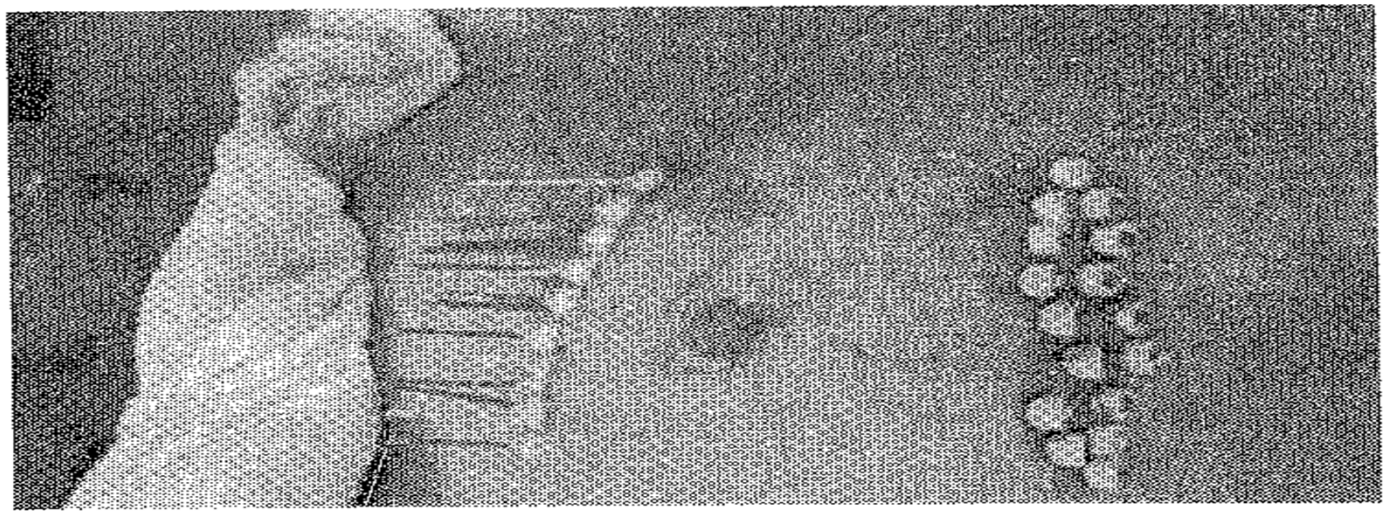
  5- 7 WEEKS OF EBRT + 1-2 WEEKS OF LUMPECTOMY CAVITY BOOST

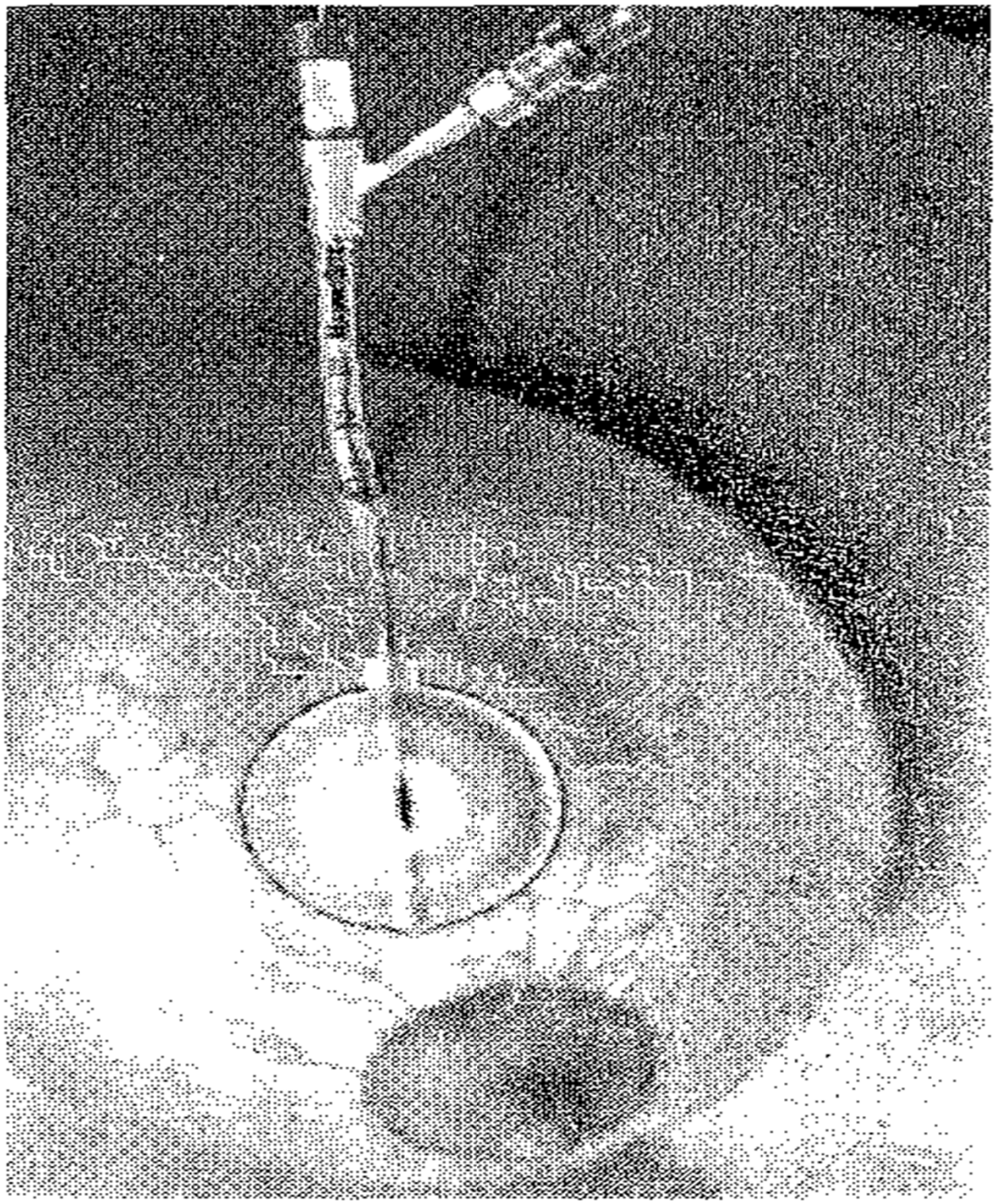
- ACCELERATED PARTIAL BREAST IRRADIATION- APBI

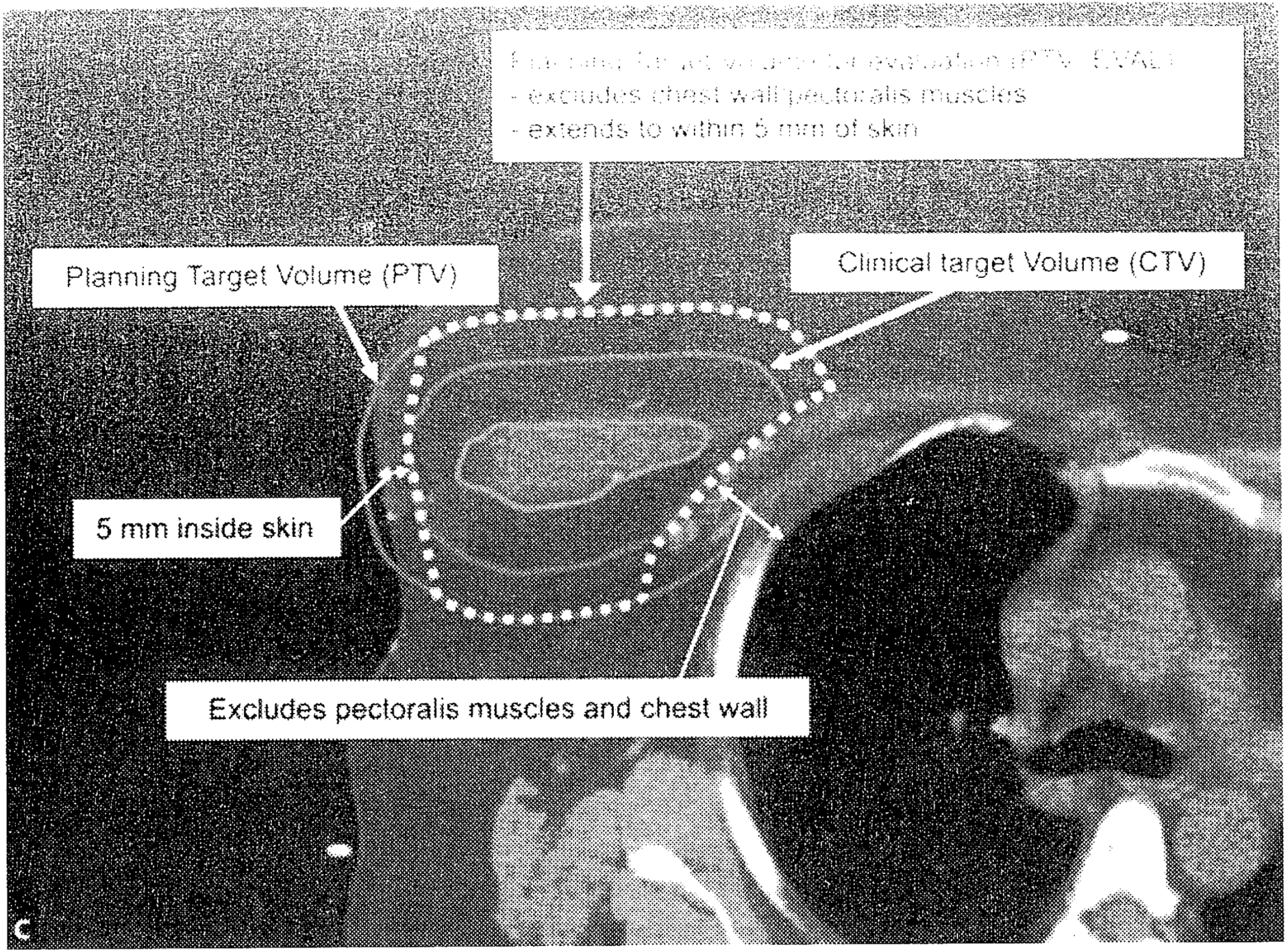
1. INTERSTITIAL CATHETER BASED BRACHY THERAPY
2. INTRACAVITORY BALLON- MAMOSITE
3. 3-D CONFORMAL RT (3-D CRT)
4. SINGLE # IORT BY INTRA BEAM PHOTON RADIO SURGERY SYSTEM


US transducer
Deep Needle
7 cm
1.2-1.5 cm
Lumpectomy Cavity
as determined by
Ultrasound
Lumpectomy Scar
Target Volume

B






- excludes chest wall/pectoralis muscles
- extends to within 5 mm of skin
Planning Target Volume (PTV)
Clinical target Volume (CTV)
5 mm inside skin
Excludes pectoralis muscles and chest wall
C

ACCELERATED PARTIAL BREAST IRRADIATION

APBI

- TARGETS REGION AT GREATEST RISK OF RECURRENCE
- TREATMENT DURATION SHORT
- LESS RADIATION TO VITAL STRUCTURE- MEDIASTINUM, IPSILATERAL LUNG
- CATHETERS AS WELL AS MAMOSITE CAN BE CONFIRMED INTRA OPERATIVELY WITH THE SURGEON. THIS TYPE OF RADIATION CAN EITHER BE ***PBI*** OR BOOST FOLLWED BY ***WBI***

Comparison of whole-breast irradiation and three modes of accelerated partial breast irradiation

Feature	Whole-breast irradiation	Interstitial catheter-based brachytherapy	Balloon-based intracavitary brachytherapy	Three-dimensional conformal radiation therapy
Dose of radiation and duration of therapy Complications and problems	50 Gy in 25 fractions, monday through friday, over 35 days ■ Lymphedema of ipsilateral extremity ■ First-degree burn to chest wall ■ Fatigue ■ Neutropenia	45 Gy to target over 5 days (continuous low-dose-rate therapy) or 3.4 Gy, 2 times a day, for 5 days (high-dose-rate therapy) ■ Difficult catheter placement ■ Infection risk associated with indwelling catheters ■ Dose-related skin injury (erythema, moist desquamation, pain, fibrosis, fat necrosis)	34 Gy in 10 fractions over 5 days [18] ■ Only two balloon inflation volumes (70 and 125 cm^3) ■ Difficult to achieve adequate skin spacing	30 Gy in 5 fractions over 10 days ■ Larger target volume needed to overcome motion artifact

NON COMPLIANCE FOR BCT

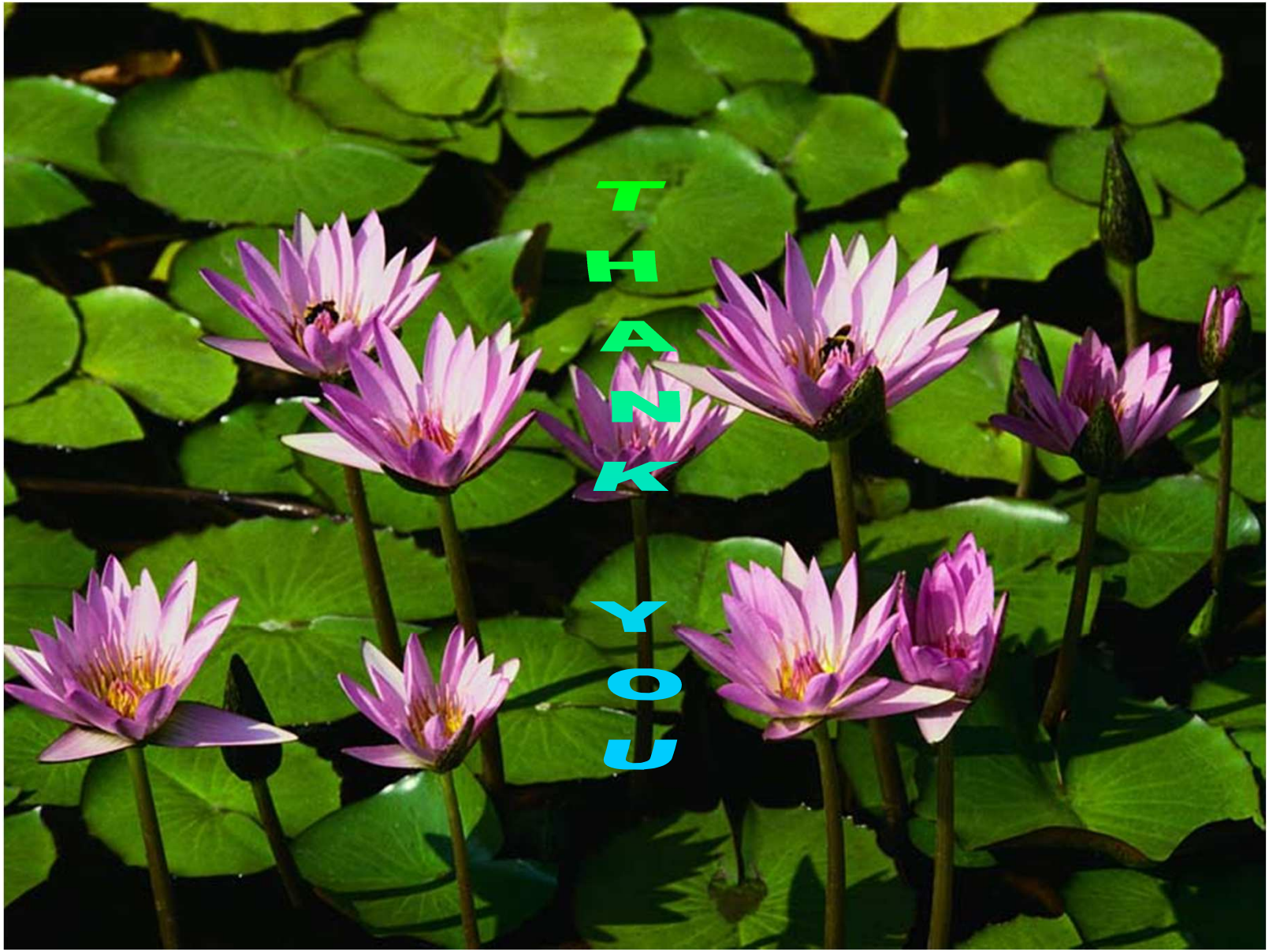
- 5-6 WEEKS OF EBRT + 1- WEEK OF BOOST
- UNWILLINGS OF WOMEN TO UNDER GO 5-6 WEEKS OF OUT PATEINT WBI OWING TO TRANSPORTATION AND EMPLOYMENT STATUS
- ADVERSE EFFECTS OF RT- LYMPH OEDEMA OF ARM, 1ST DEGREE BURNS OF SKIN, FATIGUE, NEUTROPENIA. ALL THESE FACTORS DISSUADE WOMEN FROM BCT

CONCLUSION

- **SURGEON'S CONCERN FOR VARIOUS BRACHYTHERAPY MODALITIES**

1. **MAMOSITE INSERTION REQUIRES LARGER AMOUNT OF BREAST TISSUE TO BE REMOVED, WITH ULTIMATELY POOR COSMETIC RESULT**
2. **RECURRENT SEROMA AFTER PLACMENT OF DEVICE NEEDS REPEATED ASPIRATION AND SOME TIME EXCISION OF CAVITY WITH INCREASE RATE OF POST OPERATIVE INFECTION**

- **ON GOING PHASE III TRIALS OF *WBI* / *APBI*- NSABP AND RTOG. IT REMAINS TO BE SEEN WEATHER *APBI* WILL RESULT IN LOWER LOCO REGIONAL RECURRANCE OR CONFIR ONCOLOGIC BENEFITS SIMILAR TO *WBI***


THANK YOU