MESSAGE

• BREAST CANCER MANAGEMENT MULTIMODALITY APPROACH
• CLINICIAN, PATHOLOGIST, RADIATION ONCOLOGIST, MEDICAL ONCOLOGIST, PHYSIOTHERAPIST AND SUPPORT GROUP
• RADIOTHERAPY 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
   - Excisional
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 + sentinel 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 MASTECTOMY 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 RECURRENCE

• 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
BCT AFTER NEO ADJUVANT CHEMOTHERAPY

• LABC - DUE TO SHEER LARGE SIZE OF TUMOUR > 5 CM, WELL DEFINED MARGINS, NO MULTI CENTRITYCITY, NO A OR B SIGNS

• DISPROPORTIONATE BREAST : TUMOUR RATIO, i.e. SMALL VOLUME BREAST WITH > OR = 3 CM TUMOUR
Pre-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 PATIENTS 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% RECURRENCE 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
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 FOLLOWED BY **WBI**
## Comparison of whole-breast irradiation and three modes of accelerated partial breast irradiation

<table>
<thead>
<tr>
<th>Feature</th>
<th>Whole-breast irradiation</th>
<th>Interstitial catheter-based brachytherapy</th>
<th>Balloon-based intracavitary brachytherapy</th>
<th>Three-dimensional conformal radiation therapy</th>
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<tbody>
<tr>
<td><strong>Dose of radiation and duration of therapy</strong></td>
<td>50 Gy in 25 fractions, monday through friday, over 35 days</td>
<td>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)</td>
<td>34 Gy in 10 fractions over 5 days [18]</td>
<td>30 Gy in 5 fractions over 10 days</td>
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<td><strong>Complications and problems</strong></td>
<td>Lympedema of ipsilateral extremity</td>
<td>Difficult catheter placement</td>
<td>Difficult to achieve adequate skin spacing</td>
<td>Larger target volume needed to overcome motion artifact</td>
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<td>First-degree burn to chest wall</td>
<td>Fatigue</td>
<td>Infection risk associated with indwelling catheters</td>
<td>Dose-related skin injury (erythema, moist desquamation, pain, fibrosis, fat necrosis)</td>
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<td>Neutropenia</td>
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NON COMPLIANCE FOR BCT

• 5-6 WEEKS OF EBRT + 1- WEEK OF BOOST
• UNWILLINGS OF WOMEN TO UNDER GO 5-6 WEEKS OF OUT PATIENT WBI OWING TO TRANSPORTATION AND EMPLOYMENT STATUS
• ADVERSE EFFECTS OF RT- LYMPH ODEMA 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 PLACEMENT 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 WHETHER APBI WILL RESULT IN LOWER LOCO REGIONAL RECURRANCE OR CONFIR ONCOLOGIC BENEFITS SIMILAR TO WBI