Digital Breast Tomosynthesis: Clinical Utility in the Diagnostic Setting

Smriti Hari
Additional Professor, Radiology
All India Institute of Medical Sciences
New Delhi
AIIMS Experience with Digital Breast Tomosynthesis (DBT)

4000 pts in last 2.5 yrs at AIIMS Breast Imaging Unit

OUR PROTOCOL

Dual view Digital Mammography
Single view Tomosynthesis (MLO)
in Combo Mode
Role Of DBT as an Adjunct to Full Field Digital Mammography In The Evaluation Of Breast Lesions

AIMS & OBJECTIVES

- To Compare Single view DBT with Dual view mammography in terms of:
  - Lesion detection
  - Lesion localisation and characterisation
  - BIRADS score

- To determine whether DBT allows the user more confidence in interpretation
Inclusion Criteria

250 Pts with suspicious findings on 2 view mammography (CC & MLO)

- BIRADS 0
- BIRADS 3 and 4 (for better characterisation of lesions)
- BIRADS 5 and 6 (to look for additional lesions)
Methodology

- Final diagnosis based on USG, MRI and histopathology wherever available

- 6 mth follow up in BIRADS 3 where biopsy was not be done

- Conventional mammograms and Tomo images shown to 3 radiologists (blinded to the results of other investigations)
Assessment of Performance of Tomosynthesis

- Inferior to mammography (lesions missed or wrongly characterised)

- Increased diagnostic confidence, however no change in BIRADS

- Better diagnosis, changed BIRADS category

- Better diagnosis, new lesions detected
CLINICAL EXAMPLES
TOMOSYNTHESIS CHANGED BIRADS, INFLUENCED PATIENT MANAGEMENT.
TOMOSYNTHESIS DETECTED ADDITIONAL LESION, INFLUENCED PATIENT MANAGEMENT..
TOMOSYNTHESIS CHANGED BIRADS, INCREASED DIAGNOSTIC CONFIDENCE.
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FALSE POSITIVE FOR MAMMOGRAPHY, RESOLVED BY TOMOSYNTHESIS
SUSPICIOUS FOCAL ARCHITECTURAL DISTORTION ON 2D MAMMOGRAM
FALSE POSITIVE FOR MAMMOGRAPHY, RESOLVED BY TOMOSYNTHESIS
TOMOSYNTHESIS CHANGED BIRADS, INCREASED DIAGNOSTIC CONFIDENCE..
TOMOSYNTHESIS CHANGED BIRADS, INCREASED DIAGNOSTIC CONFIDENCE.
DBT IMPROVES USER CONFIDENCE, HOWEVER NO CHANGE IN BIRADS
DBT IMPROVES USER CONFIDENCE, HOWEVER NO CHANGE IN BIRADS
Performance of Tomosynthesis

- equivalent
- increased confidence
- changed BIRADS (better)
- new lesions
- wrong categorisation
- decreased confidence
Artifacts in digital breast tomosynthesis
Blur and Ripple Effect
## Screening Setting

<table>
<thead>
<tr>
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<th>Tomosynthesis Group (6100 pts)</th>
<th>Conventional Mammography group (7356 pts)</th>
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<tbody>
<tr>
<td><strong>Recall rate</strong></td>
<td>8.4%</td>
<td>12%</td>
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<td><strong>Cancer Detection Rate</strong></td>
<td>5.7/1000</td>
<td>5.2/1000</td>
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*Haas et al, Radiology July 2013*
57 pts of proven Breast Cancer

Combo DBT more informative in 58.8% masses, 83.3% focal asymmetries, 94.4% architecture distortion, and 11.6% calcifications

Yang et al, BioMed Research International July 2013
To Conclude...

- Tomosynthesis has different role/ performance in the Screening and Diagnostic Settings

- Detection of new lesions
- Ruling out false lesions

- Better delineation of the lesion margin (microlobulations or subtle spiculations)

Often USG by an experienced radiologist in addition to a mammography, may provide as much or more information than Tomosynthesis in Diagnostic Setting.