Role of Histopathology in metastatic breast cancer

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Breast CANCER

- Breast cancer is the most common cancer in the UK and is the second most lethal cancer in women.
- Around 55,000 people are diagnosed with breast cancer each year.
- About 400 cases of breast cancer annually are in men.
Metastases

• Metastasis refers to the spread of cancer to different parts of the body, typically the bones, liver, lungs and brain.

• 20% to 30% of people initially diagnosed with early stage disease will develop metastatic breast cancer.

• About 6% to 10% of people are Stage IV from their initial diagnosis.
Metastases

- Metastatic breast cancer can occur 5, 10 or 15 years after a person’s original diagnosis and successful treatment checkups and annual mammograms.

- Treatment choices are guided by breast cancer type, location and extent of metastasis in the body, previous treatments and other factors.
Role of Pathologist

- Confirm the diagnosis of recurrent/metastatic disease:

  - Regional recurrence: Cytology FNA
    Core biopsy

  - Distant metastasis: Cytology: Pleural Fluid
    Biopsy: Pleural, Liver, brain
LUNG Mets
Breast mets Bone Marrow aspirate
Pathology

• Confirm type and grade

• Whether or not it is hormone sensitive

• Whether or not it is HER2 positive
Oestrogen Receptor

• All breast cancers metastases should be tested for oestrogen receptors
• Allred/Quick Score—a score (usually out of 8) is used to indicate a combination of the average amount of hormone receptors per cancer cell and the proportion of cells with receptors.
• A score of 3 and above is considered positive
## Quick Score

**Table: Guidelines for interpretation of ER results by Allred Method.**

<table>
<thead>
<tr>
<th>Proportion Score (PS)</th>
<th>Observation</th>
<th>Intensity Score (IS)</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>NONE</td>
<td>0</td>
<td>None</td>
</tr>
<tr>
<td>1</td>
<td>1%</td>
<td>1</td>
<td>Weak</td>
</tr>
<tr>
<td>2</td>
<td>1-10%</td>
<td>2</td>
<td>Intermediate</td>
</tr>
<tr>
<td>3</td>
<td>10-33%</td>
<td>3</td>
<td>Strong</td>
</tr>
<tr>
<td>4</td>
<td>33-66%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>66-100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Score</td>
<td></td>
<td></td>
<td>Interpretation</td>
</tr>
</tbody>
</table>

**Sum of proportion score and intensity score**

<table>
<thead>
<tr>
<th></th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2</td>
<td>Negative</td>
</tr>
<tr>
<td>3-8</td>
<td>Positive</td>
</tr>
</tbody>
</table>
Progesterone Receptor

- Progesterone receptor are not routinely tested in all laboratories
- When it is tested it is scored the same as Oestrogen, using Allred/Quick Score
- About 75% of breast cancers are oestrogen receptor-positive (ER-positive, or ER+). About 65% of ER-positive breast cancers are also progesterone receptor-positive (PR-positive, or PR+)
Impact or changes of ER and PR in Primary and Mets

• patients with tumors that changed from ER positive primary to negative metastasis (9.7%) (Positive/Negative) experienced significantly shorter median survival (669 days vs 1131 days).

• The changes in PR status (35%) which were mainly positive to negative, not associated with a change in survival.

• ER status of the metastatic lesion was a better predictor of survival. Therefore, optimal metastatic treatment cannot be determined solely on primary ER and PR analysis.
Her 2

• 15–20% of invasive breast cancers are HER2 positive
• IHC is usually carried out first. This is reported as a score ranging from 0–3. Score 0 and 1+ is negative, 3+ is positive.
• Breast cancers with borderline IHC (+2) results should be retested with FISH or CISH to confirm if they are truly HER2 positive.
• It is important to reassess the HER2 status of recurrent disease, as discrepancy between the primary and recurrent cancer occurs at least five percent of the time.
Her 2 IHC
Her 2 FISH
Gene Expression Profiling

- Gene expression profiling tests (Oncotype DX) examine a set of genes in tumor tissue to determine the likelihood of breast cancer recurrence.
- These tests are also used to help determine whether adjuvant (following surgery) drug treatments should be given.
- Gene expression profiling tests are recommended to newly diagnosed patients with node-negative, estrogen-receptor-positive breast cancer.
Thank you

For listening