Does Molecular Subtype Matter in Breast Cancer Patients Receiving Intraoperative Radiation Therapy (IORT)?

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Background

- Luminal A tumors and Luminal B HER2-negative tumors are two molecular subclasses of breast tumors that have varied prognoses and different responses to therapy.
- This study compares local recurrence rates in patients with these tumor subtypes treated with IORT.

Methods

- 640 patients with invasive ductal carcinoma treated with excision plus IORT alone.
- Patients who received whole breast radiation in addition to IORT were excluded.
- Immunohistochemical analysis was used as a surrogate for molecular subtyping.
  - Luminal A: ER and/or PR positive, HER2 negative and had a Ki67 less than 15%. If Ki67 was 15-19%, then PR had to be more than 20% positive.
  - Luminal B HER2 Negative: ER and/or PR positive, HER2 negative and had a Ki67 ≥ 20%
- Any ipsilateral breast tumor event was considered a local recurrence, regardless of location.
- Kaplan-Meier analysis was used to predict local recurrence rates.

Results

- Following IORT as the full course of radiation therapy, Luminal A patients have a lower local failure rate (3.2%) than luminal B HER2 negative tumors (9.2%) at 4 years (p = 0.002).
- The current published radiation oncology guidelines do not consider molecular subtype when determining suitability for IORT.
- Our results suggest that the patient and the physician may want to consider tumor molecular subtype when selecting IORT as the only radiation therapy.

Conclusions

- Table 1: Number and percentage of local recurrences by molecular subtype, further subdivided by same quadrant recurrences.

<table>
<thead>
<tr>
<th>Subtype</th>
<th>Luminal A</th>
<th>Luminal B</th>
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<tbody>
<tr>
<td>n</td>
<td>500</td>
<td>138</td>
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<tr>
<td>All recurrences</td>
<td>10 (2.0%)</td>
<td>8 (5.8%)</td>
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<tr>
<td>Same Quadrant</td>
<td>7 (1.4%)</td>
<td>6 (4.3%)</td>
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Figure 1: Kaplan-Meier curve of local recurrences luminal A versus luminal B (HER2 negative) invasive ductal carcinoma receiving IORT alone without WBRT.

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