Oral Abstract

Factors Predictive Of Aborted Intraoperative Breast Radiation Using The INTRABEAM® System

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Factors Predictive Of Aborted Intraoperative Breast Radiation Using The INTRABEAM® System

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Background

• APBI –
  • therapy for early stage breast cancer
  • adequate local control
  • minimal morbidity

• IORT - single session during lumpectomy (+SLNB) as definitive XRT or planned boost

• In up to 20% of patients, planned IORT is not completed
Objective

• Evaluate factors predicting failure to complete planned IORT.
Methods

• IRB-approved, retrospective review of consecutive cases from 2011-2015.

• **Eligibility criteria** for IORT as definitive radiation therapy included:
  
  – Age \( \geq 60 \) (age 50-59 cautionary)
  
  – Invasive ductal or mammary carcinoma
  
  – Tumor \( \leq 3.1 \) cm, ER positive and clinically node negative
Methods

• Gross pathologic evaluation:
  – Any margin grossly $\leq 5 \text{ mm}$ was re-excised before proceeding with IORT

• Intraoperative ultrasound:
  – distance from skin-to-surface of applicator measurement of $\geq 1.0 \text{ cm}$ in all directions.

• Decision to abort IORT: discretion of the attending breast surgical oncologist and radiation oncologist
Demographic and clinical features associated with aborted IORT

<table>
<thead>
<tr>
<th>Variable</th>
<th>Completed IORT (n=124)</th>
<th>Aborted IORT (n=21)</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years), mean ± SD</td>
<td>71.0 ± 7</td>
<td>69 ± 7</td>
<td>0.35</td>
</tr>
<tr>
<td>Tumor Size (cm), mean</td>
<td>1.0 (0.3-3.5)</td>
<td>1.3 (0.2-3.5)</td>
<td>0.40</td>
</tr>
<tr>
<td>Additional Intraoperative Margin n (%)</td>
<td>59 (48)</td>
<td>17 (81)</td>
<td>0.005</td>
</tr>
<tr>
<td>Final Margin Positive n (%)</td>
<td>7 (6)</td>
<td>0 (0)</td>
<td>0.17</td>
</tr>
<tr>
<td>Sentinel Lymph Node Positive n (%)</td>
<td>8 (6)</td>
<td>2 (9)</td>
<td>0.77</td>
</tr>
<tr>
<td>Received Adjuvant WBRT n (%)</td>
<td>13 (10)</td>
<td>17 (81)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
# Reasons for aborted IORT

<table>
<thead>
<tr>
<th>Reason</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate Distance to Skin</td>
<td>15 (71)</td>
</tr>
<tr>
<td>Altered wire localization findings</td>
<td>4 (19)</td>
</tr>
<tr>
<td>Equipment failure</td>
<td>1 (5)</td>
</tr>
<tr>
<td>Hemodynamic instability</td>
<td>1 (5)</td>
</tr>
</tbody>
</table>
Preop CC and MLO mammogram views from aborted IORT case

- Tumor characteristics:
  - 4mm IDC, grade I
  - ER/PR+, Her2neu –

- Re-excised inferior margin based on gross pathology examination.

- Intraoperative US:
  - IORT aborted due to <7mm distance from skin surface-to-device.
### Completed versus Aborted IORT Cases by Surgeon

<table>
<thead>
<tr>
<th>Surgeon</th>
<th>Completed (n=124)</th>
<th>Aborted (n=21)</th>
<th>% Aborted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgeon A</td>
<td>67</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Surgeon B</td>
<td>26</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Surgeon C</td>
<td>21</td>
<td>8</td>
<td>27</td>
</tr>
<tr>
<td>Surgeon D</td>
<td>7</td>
<td>7</td>
<td>50</td>
</tr>
<tr>
<td>Surgeon E</td>
<td>3</td>
<td>3</td>
<td>50</td>
</tr>
</tbody>
</table>
Conclusions

• Careful preoperative planning and selection
  – uni-centric disease
  – well-defined margins on imaging
  – tumor location remote from skin
  – Larger specimen to reduce the need for additional margins intra-operatively

• Eliminate 90% of aborted cases
Conclusion

• Awareness of these factors during one’s IORT learning curve may lower the failure rate.
The 2016 U.S. INTRABEAM® User Meeting has been sponsored by ZEISS.

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