1200 Patients Treated with Intraoperative Radiation Therapy (IORT): Analyzed by Different Lengths of Follow-up

Crystal Fancher, M.D.,1,2 Melinda S. Epstein, Ph.D.3 Sadia Khan, D.O.1,2 Peter Chen, M.D.4 Brian Kim, M.D.4 Kevin Lin, M.D.4 Lincoln Snyder, M.D.1 Colleen Coleman, M.D.1 January Lopez, M.D.5 Lisa E. Guerra, M.D.1 Melvin J. Silverstein, M.D.1,2

1 Department of Surgery, Hoag Memorial Hospital Presbyterian, Newport Beach, CA 92663, 2 Keck School of Medicine, University of Southern California, Los Angeles, CA 90033 3 Department of Research, Hoag Memorial Hospital Presbyterian, Newport Beach, CA 92663 4 Department of Radiation Oncology, Hoag Memorial Hospital Presbyterian, Newport Beach, CA 92663 5 Department of Radiology, Hoag Memorial Hospital Presbyterian, Newport Beach, CA 92663

Correspondence: crystal.fancher@gmail.com

Background

• Intraoperative radiotherapy (IORT) permits accurate delivery of radiation therapy directly to the tumor bed at the time of surgery, greatly simplifying breast conservation.
• Two prospective randomized trials have been published (ELIOT and TARGIT A), supporting IORT as a possible alternative to whole breast radiation therapy (WBRT).
• This report analyzes the probability of local recurrence among 1200 patients treated with IORT at the same facility, with a median follow-up of 48 months.
• To determine whether 48 months of follow-up yielded accurate results, we looked at smaller groups of earlier patients with longer follow-up.

Methods

• IORT was delivered using the Xoft Axcent eBx™ System to 1200 consecutive patients from May 2010 to September 2019.
• Local recurrence was the endpoint of the study.
• All ipsilateral tumor events were included, both invasive and DCIS, regardless of location (same or different quadrant).
• The patients were analyzed by the 1st 400 vs the 1st 600 vs the 1st 800 vs the 1st 1000 vs all 1200.
• Kaplan-Meier Analysis was used to calculate the probability of local recurrence for each group.
• Groups were compared using the log-rank test.

Results

• The table shows the median follow-up, the number of recurrences, and the 4 and 5-yr probabilities of local recurrence for each group.
• As the groups get larger, recurrences increase and follow-up decreases.
• In spite of the decreasing length of follow-up, there is no statistical difference between any of the groups.
• When the 1st 400 is compared with all 1200, the difference is not significant (p = 0.45).

<table>
<thead>
<tr>
<th>By Date Rx</th>
<th>Follow-Up Years (Months)</th>
<th>Number of Recurrences</th>
<th>4-Year Recurrence</th>
<th>5-Year Recurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st 400</td>
<td>6.0 years (72)</td>
<td>22</td>
<td>3.3%</td>
<td>4.5%</td>
</tr>
<tr>
<td>1st 600</td>
<td>5.3 years (64)</td>
<td>30</td>
<td>2.8%</td>
<td>4.4%</td>
</tr>
<tr>
<td>1st 800</td>
<td>5.0 years (60)</td>
<td>41</td>
<td>3.8%</td>
<td>5.4%</td>
</tr>
<tr>
<td>1st 1000</td>
<td>4.3 years (62)</td>
<td>46</td>
<td>4.0%</td>
<td>5.5%</td>
</tr>
<tr>
<td>1st 1200</td>
<td>4.0 years (48)</td>
<td>47</td>
<td>4.0%</td>
<td>5.5%</td>
</tr>
</tbody>
</table>

Conclusions

• The 5-year probability of local recurrence for 1200 patients treated with IORT was 5.5%. Statistical evaluation suggests this is accurate.
• When invasive recurrence is the endpoint, the probability of local invasive recurrence at 5-years drops to 4.0%.
• If any recurrence (invasive and DCIS) in the same quadrant is the endpoint, the 5-year probability drops to 3.2%.
• IORT appears to be a safe alternative to WBRT in properly selected patients.
• Longer follow-up is not likely to increase the 5-year probability of recurrence.