Positive Sentinel Lymph node, Now what?

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Case

- 33 yr. old female with PMH of obesity presented with 2 month history of unilateral right sided bloody nipple discharge.
- PE
- NAD
- Pendulous breasts, no discrete masses, multiple lumps felt on exam bilaterally.
- No axillary adenopathy
- No family history of breast cancer.
Case

- Breast sonogram revealed, dilated terminal ducts, mass cannot be excluded
- The patient underwent a terminal duct excision on 5/28/13
- Pathology from the specimen revealed a 2cm x 2cm DCIS with comedo necrosis, high grade, positive posterior margins
Case

- The patient elected for mastectomy with delayed reconstruction.
- On 6/28/13 she underwent a total mastectomy with sentinel lymph node biopsy.
- Pathology revealed DCIS within posterior portion of previous lumpectomy site, negative sentinel lymph node
Breast Cancer History

- Joseph Pancoast illustrated en block removal of the breast with its axillary lymphatic drainage in 1844.
- 1894 Radical mastectomy described by Halsted and Meyer was the standard of care for breast cancer for almost 70 yrs.
- Geoffrey Keynes demonstrated less radical surgery with radiation gave equal results to radical mastectomy
Breast Cancer History

- Patey and Dyson from Middlesex Hospital reported similar survival rates between simple mastectomy and radiotherapy vs. modified radical mastectomy (axillary nodes level I and II).
- Donald Morton developed the sentinel lymph node biopsy technique.
- NSABP B-32 and ALMANAC trials proved that SLB was statistically equivalent with ALND in terms of overall, disease free and regional control.
Surgical Axillary Staging - Stage I, IIA, IIB, and IIIA T3, N1, M0

Clinically node positive at time of diagnosis → FNA or core biopsy positive → Axillary dissection level I/II
See Axillary Lymph Node Staging (BINV-E)

Clinically node negative at time of diagnosis

Clinical Stage I, IIA, IIB, and IIIA T3, N1, M0

FNA or core biopsy negative → Sentinel node negative → No further surgery (category 1)

Sentinel node mapping and excision → Sentinel node positive

Meets ALL of the following criteria:
- T1 or T2 tumor
- 1 or 2 positive SLNs
- Breast-conserving therapy
- Whole-breast RT planned
- No neoadjuvant chemotherapy

Sentinel node not identified → Axillary dissection level I/II
See Axillary Lymph Node Staging (BINV-E)
Axillary Dissection vs No Axillary Dissection in Women With Invasive Breast Cancer and Sentinel Node Metastasis: A Randomized Clinical Trial

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Axillary lymph node dissection (ALND) has been part of breast cancer surgery since the description of the radical mastectomy. ALND reliably identifies nodal metastases and maintains regional control, but the contribution of local therapy to breast cancer survival is controversial. The Early Breast Cancer Trialists’ Collaborative Group synthesized findings from 78 randomized controlled trials, concluding that local control of breast cancer was associated with improved disease-specific survival.

ALND, as a means for achieving local disease control, carries an indisputable and often unacceptable risk of complications such as seroma, infection, and lymphedema. Sentinel lymph node dissection (SLND) was therefore developed to provide an alternative means of achieving local disease control with a reduced risk of complications. Sentinel lymph node dissection accurately identifies nodal metastases of early breast cancer, but it is not clear whether further nodal dissection affects survival.

Objectives

To determine the effects of complete axillary lymph node dissection (ALND) on survival of patients with sentinel lymph node (SLN) metastasis of breast cancer.

Design, Setting, and Patients

The American College of Surgeons Oncology Group Z0011 trial, a phase 3 noninferiority trial conducted at 115 sites and enrolling patients from May 1999 to December 2004. Patients were women with clinical T1-T2 invasive breast cancer, no palpable adenopathy, and 1 to 2 SLNs containing metastases identified by frozen section, touch preparation, or hematoxylin-eosin staining on permanent section. Targeted enrollment was 1900 women with final analysis after 500 deaths, but the trial closed early because mortality rate was lower than expected.

Interventions

All patients underwent lpectomy and tangential whole-breast irradiation. Those with SLN metastases identified by SLND were randomized to undergo ALND or no further axillary treatment. Those randomized to ALND underwent dissection of 10 or more nodes. Systemic therapy was at the discretion of the treating physician.

Main Outcome Measures

Overall survival was the primary end point, with a noninferiority margin of a 1-sided hazard ratio of less than 1.3 indicating that SLND alone is noninferior to ALND. Disease-free survival was a secondary end point.

Results

Clinical and tumor characteristics were similar between 445 patients randomized to ALND and 446 randomized to SLND alone. However, the median number of nodes removed was 17 with ALND and 2 with SLND alone. At a median follow-up of 6.3 years (last follow-up, March 4, 2010), 5-year overall survival was 91.8% (95% confidence interval [CI], 89.1%-94.5%) with ALND and 92.5% (95% CI, 90.0%-95.1%) with SLND alone; 5-year disease-free survival was 82.2% (95% CI, 78.3%-86.3%) with ALND and 83.9% (95% CI, 80.2%-87.9%) with SLND alone. The hazard ratio for treatment-related overall survival was 0.79 (90% CI, 0.56-1.11) without adjustment and 0.87 (90% CI, 0.62-1.23) after adjusting for age and adjuvant therapy.

Conclusion

Among patients with limited SLN metastatic breast cancer treated with breast conservation and systemic therapy, the use of SLND alone compared with ALND did not result in inferior survival.

Trial Registration clinicaltrials.gov Identifier: NCT00003855
Z0011 Study Design Schema

Biopsy Proven Breast Cancer

Clinical T1 or T2, N0, M0

Lumpectomy and SLND

Tumor + SN

Eligible and Consent Given

Register

Randomize

Arm 1: ALND

Arm 2: No Further Axillary Treatment

Whole Breast Irradiation & Adjuvant Systemic Therapy

Follow-up
No. at risk

<table>
<thead>
<tr>
<th>ALND</th>
<th>420</th>
<th>408</th>
<th>398</th>
<th>391</th>
<th>378</th>
<th>313</th>
<th>223</th>
<th>141</th>
<th>74</th>
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</thead>
<tbody>
<tr>
<td>SLND alone</td>
<td>436</td>
<td>421</td>
<td>411</td>
<td>403</td>
<td>387</td>
<td>326</td>
<td>226</td>
<td>142</td>
<td>74</td>
</tr>
</tbody>
</table>

Log-rank $P = .25$
ACOSOG Z0011

Potentially practice changing, ALND may no longer be required in patients who meet the following criteria:

- T1-2 Tumors
- One to two positive SLN without extra-capsular extension
- Patient acceptance and completion of whole-breast radiation therapy without extended fields
- Patient acceptance and completion of adjuvant therapy (hormonal, cytotoxic, or both)
ACOSOG Z0011 is NOT applicable to

- T3 tumors
- Have more than 2 positive LN
- Are undergoing mastectomy
- Are undergoing partial breast radiation
- Have identified as having matted axillary nodes or pre-operative palpable nodes
- Are receiving neo-adjuvant chemotherapy
## Guidelines for sentinel lymph node node findings

<table>
<thead>
<tr>
<th>Biopsy Results</th>
<th>Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative sentinel lymph nodes</td>
<td>No further axillary surgery required, ALND may be omitted</td>
</tr>
<tr>
<td>Positive lymph nodes at presentation</td>
<td>ALND should be performed</td>
</tr>
<tr>
<td>Positive sentinel lymph node(s) 1-2 positive lymph nodes</td>
<td>ALND may be omitted if:</td>
</tr>
<tr>
<td></td>
<td>- Primary tumor is &lt;= 5cm</td>
</tr>
<tr>
<td></td>
<td>- Clinically negative axilla</td>
</tr>
<tr>
<td></td>
<td>- Will receive whole breast radiation systemic therapy</td>
</tr>
<tr>
<td>3 or more positive sentinel lymph nodes</td>
<td>Completion ALND should be performed</td>
</tr>
</tbody>
</table>
Hormonal status

<table>
<thead>
<tr>
<th>Hormone Receptor</th>
<th>Node</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>Positive (1 or 2 nodes &gt;2mm)</td>
<td>-Adjuvant endocrine + Adjuvant chemotherapy</td>
</tr>
<tr>
<td>Negative</td>
<td>-No(no nodes)</td>
<td>-Consider adjuvant endocrine</td>
</tr>
<tr>
<td></td>
<td>-N1mi (&lt;2mm nodes)</td>
<td>-Adjuvant endocrine +/- adjuvant chemotherapy</td>
</tr>
</tbody>
</table>
In Summary

• SLB is indicated in clinically node negative T1-3 tumors
• SLB is not indicated in T4 tumors of those with inflammatory breast cancers.
• Unclear whether or not to perform SLB after neoadjuvant chemotherapy in patients with clinically positive nodes prior to systemic therapy.
Questions

A 46-year-old woman is diagnosed with invasive ductal carcinoma of the right breast. She is scheduled for lumpectomy and sentinel node biopsy (SNB).

Which of the following is true regarding selection of patients for SNB?

A) Patients with multicentric breast cancer cannot undergo SNB
B) Identification of the sentinel node will not be accurate in patients who have undergone previous breast procedures such as breast reduction
C) SNB can be performed in patients who have undergone excisional biopsy
D) Periareolar injection will not be accurate in patients with multifocal tumors
E) Patients with inflammatory breast cancer are good candidates for SNB
Questions

• A 36-year-old woman is undergoing SNB with injection of both radiocolloid and blue dye.

• Which of the following is true regarding identification of sentinel nodes?

  • A) Nodes with a radioactivity count of less than 15% of the ex vivo count should not be removed
  • B) A node must be both radioactive and have blue staining to be classified a sentinel node
  • C) Firm palpable nodes should be removed but are not considered sentinel nodes
  • D) Entry of a blue-stained lymphatic vessel into a lymph node indicates that it is a sentinel node
  • E) Nodes must be entirely stained blue to be considered positive