Surgical Management of the Axilla in Early Stage Breast Cancer

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BREAST CANCER 2016: Surgical Management of the Axilla

- Historical perspective on the axilla
- Sentinel node excision for staging
- Sentinel node excision for treatment
- Setting up a sentinel node program
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AXILLARY RECURRENCE: NSABP B-04, 25 year follow-up

- 1,079 clinically node-negative patients
  1. Radical mastectomy
  2. Total mastectomy + axillary XRT
  3. Total mastectomy with salvage ALND (365 pts)

- 586 clinically node-positive patients
  1. Radical mastectomy
  2. Total mastectomy + axillary XRT

- No systemic therapy in either arm

AXILLARY RECURRENCE: 
NSABP B-04, 25 year follow-up

● Population
  – 70% over age 50
  – 3.3cm mean tumor size (T2)
  – 40% node positive in RM group

● Outcome comparing randomized groups
  – No difference in disease-free survival
  – No difference in overall survival

Axillary recurrence in 68 / 365 (18.6%)
  - Half of occult node positive cancers recurred
  - Median time to recurrence 14.8 months
  - One patient could not be resected

TM specimens contained nodes in 35%
  - 23%: 1 - 5 lymph nodes
  - 12%: >5 lymph nodes

AXILLARY NODE DISSECTION:
Complication Rates

- Lymphedema
  - Acute: 40%
  - Chronic: 15-20%
- Paraesthesia: 40%
- Need for a drain: 100%
- Seroma formation: 10%
LYMPHEDEMA PRESENTATION

Mild - stage I (left)  Moderate – stage II (left)  Severe – stage III (right)

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SENTINEL NODE CONCEPT
Sentinel Node vs. Axillary Dissection Specimen:

- Sentinel Node Resection
- Axillary Dissection
A Randomized, Phase III Clinical Trial to Compare Sentinel Node Resection to Axillary Dissection in Clinically Node-Negative Breast Cancer Patients

Definitive Analysis of the Primary Outcomes

DN Krag, SJ Anderson, TB Julian, A Brown, SP Harlow, JP Costantino, T Ashikaga, D Weaver, EP Mamounas, N Wolmark
Clinically Negative Axillary Nodes

Randomization

GROUP 1
SN + AD

SN Pos

SN Neg (SN+AD)

FU

1,975 patients

GROUP 2
SN

Intraop cytology & postop HE

SN pos + AD

SN Neg (SN only)

FU

2,011 patients

Stratification

• Age
• Clinical Tumor Size
• Type of Surgery

B-32

2,011 patients

FU

1,975 patients
NSABP Protocol B-32

Disease-Free Survival for Sentinel Node Negative Patients

<table>
<thead>
<tr>
<th>Trt</th>
<th>N</th>
<th>Deaths</th>
<th>HR</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNR+AD</td>
<td>1975</td>
<td>315</td>
<td>1.05</td>
<td>0.542</td>
</tr>
<tr>
<td>SNR</td>
<td>2011</td>
<td>336</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Data as of December 31, 2009

Krag, et al., Lancet Oncol 11:927, 2010
# Local and Regional Recurrences as First Events

<table>
<thead>
<tr>
<th>Location</th>
<th>Group 1 SN + AD</th>
<th>Group 2 SN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>54 (2.7%)</td>
<td>49 (2.4%)</td>
</tr>
<tr>
<td>Axillary</td>
<td>2 (0.1%)</td>
<td>8 (0.3%)</td>
</tr>
<tr>
<td>Extra-axillary</td>
<td>5 (0.25%)</td>
<td>6 (0.3%)</td>
</tr>
</tbody>
</table>

*Krag, et al., Lancet Oncol 11:927, 2010*
Residual Morbidity at End of Follow-up

- Lower in SN group
- Not nonexistent

<table>
<thead>
<tr>
<th></th>
<th>Group 1 SN + AD</th>
<th>Group 2 SN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shoulder abduction deficit</td>
<td>19%</td>
<td>13%</td>
</tr>
<tr>
<td>Arm volume difference &gt;5%</td>
<td>28%</td>
<td>17%</td>
</tr>
<tr>
<td>Arm numbness</td>
<td>31%</td>
<td>8%</td>
</tr>
<tr>
<td>Arm tingling</td>
<td>13%</td>
<td>7%</td>
</tr>
</tbody>
</table>

All differences p<0.001

Ashikaga JSO 102:111, 2010

Krag, et al., Lancet Oncol 11:927, 2010
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Peace and Love Hospital (Kumasi, Ghana) 2004
Recurrent breast cancer in axillary lymph node bed
ACOSOG Z0011: A Randomized Trial of Axillary Node Dissection in Women with Clinical T1-2 N0 M0 Breast Cancer who have a Positive Sentinel Node

Giuliano AE, McCall L, Beitsch PD, Whitworth PW, Blumencranz PW, Leitch AM, Saha S, Hunt K, Morrow M, Ballman KV

Hypothesis: SLND alone achieves similar locoregional control and survival as Level I and II ALND for H&E SN node-positive women.

Z0011 Study Design Schema

Breast Cancer Clinical T1 or T2, N0, M0 → BCT, SLND with Positive SN → Randomize

Arm 1: ALND → Breast Radiation Therapy, Systemic Adjuvant Therapy

Arm 2: No further surgery

Follow

Inclusion/Exclusion Criteria

Eligibility

• Clinical T1 T2 N0 breast cancer
• H&E-detected metastases in SN (AJCC 5th edition)
• Lumpectomy with whole breast irradiation
• Adjuvant systemic therapy by choice

Ineligibility

• Third field (nodal irradiation) or APBI
• Metastases in SN detected by IHC
• Matted nodes
• 3 or more involved SN


SN-Positive Randomized Patients  
N = 891

- ALND Arm  
  N = 445
  25 patients withdrew prior to surgery

- SLND only Arm  
  N = 446
  10 patients withdrew

Intent-to-Treat Sample

- ALND Arm  
  N = 420

- SLND only Arm  
  N = 436

Treatment Received Sample

- ALND Arm  
  N = 388

- SLND only Arm  
  N = 425

11 patients had ALND
## Adjuvant Systemic Therapy

<table>
<thead>
<tr>
<th></th>
<th>ALND</th>
<th>SLND</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemotherapy</td>
<td>57.9%</td>
<td>58.0%</td>
</tr>
<tr>
<td>Hormonal therapy</td>
<td>46.4%</td>
<td>46.6%</td>
</tr>
<tr>
<td>Either/Both</td>
<td>96.0%</td>
<td>97.0%</td>
</tr>
</tbody>
</table>

\[ P = \text{N.S.} \]
106 (27.4%) patients treated with ALND had additional positive nodes removed beyond SN.

### Locoregional Recurrences

<table>
<thead>
<tr>
<th>Recurrence</th>
<th>ALND (420 pts)</th>
<th>SLND (436 pts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local (Breast)</td>
<td>15 (3.6%)</td>
<td>8 (1.8%)</td>
</tr>
<tr>
<td>Regional (Axilla, Supraclavicular)</td>
<td>2 (0.5%)</td>
<td>4 (0.9%)</td>
</tr>
<tr>
<td>Total Locoregional</td>
<td>17 (4.1%)</td>
<td>12 (2.8%)</td>
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*Median follow-up = 6.3 years
Regional recurrence seen in only 0.7% of the entire population

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Lymphatic Mapping Learning Curve: Surgeon-Specific

Failure Rate

Cases

0  10  20  30  40  50  60  70  80  90  100

Mean
Axillary recurrences seen in the 1970s have not continued in the era of modern adjuvant therapy.

Sentinel node biopsy is now the standard of care for axillary staging with clinically node-negative cancers.

Complete axillary node dissection has remained the standard of care with clinically node-positive cancers.

Establishing a sentinel node program requires collaboration between surgery, pathology and nuclear medicine and training as a team for success.