



## Management of the Internal Mammary Node in the Sentinel Node Era

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In this session, David R. Byrd, MD, reviews the history, relevance and current state of the art of internal mammary node mapping. The following summarizes Dr. Byrd's presentation.

### **The Internal Mammary Node (IMN) in Breast Cancer - Global view**

- Historical studies of extended radical mastectomy demonstrate that resection of IMNs does not improve overall survival or recurrence-free survival.<sup>1,2</sup>
- In the NSABP B-04 trial only 1% of patients had IMN clinical node positivity as site of recurrence.
- The incidence of IMN-only positive nodes is 4% to 5%. Biopsy findings rarely change systemic treatment
- Recent studies demonstrate that fewer patients now have positive nodes. In the Z0010 study, only 25% of patients had positive axillary nodes. In addition, not all positive nodes become clinically apparent. In NSABP B-06, for example, only half of the patients developed clinically positive axillary nodes.

### **Clinical Relevance of IMN Status in the Sentinel Node Era**

- In historical surgical studies, 22.5% of patients had positive IMNs, and 4% to 5% had IMN-only positive nodes.<sup>3</sup> Several recent studies have had similar findings, as illustrated in Table 1.
- In the 5<sup>th</sup> edition of the AJCC staging manual, the presence of positive IMNs was considered N3 disease. This has changed in the 6<sup>th</sup> edition probably reflecting a closer review of earlier data such as the series by Urban et al.<sup>4</sup>
- As illustrated in Table 2, patients who were negative in both sites had good 10-year survival. However, if only the axilla was positive, 10 year survival dropped to 53%. If only the IMN was positive, survival was nearly identical (52%).
- IMN status has major implications on radiation treatment planning and changes clinical staging. In selected patients, knowledge of internal mammary pathology may change systemic management and regional management in > 25% of patients.
- Although internal mammary recurrence is uncommon, it has high morbidity.

**Table 1. Pathological Status of IMN of Recent Series of Selected Patients Using SLND**

	Ax(+) Pos IMN n (%)	Ax(-) IMN(+) n (%)	overall IMN(+) n (%)	Ax (+) n (%)
Galimberti, n=160 2002	14 (8.8%)	10 (28%)	4 (2.5%)	55 (34%)
Estourgie*, n=130 2003 *changed mgmt 38 pts (29%)	22 (17%)	13 (10%)	9 (7%)	28/134 (21%)
Dupont, n=36 2001	5 (14%)	2 (6%)	3 (8%)	
Van der Ent n=41 2001	11 (27%)	8 (20%)	3 (7.3%)	115/256 (45%)

**Table 2. IMN Status with Extended Radical Mastectomy– Implications on Staging**

Survival	5 yr	10 yr
Ax + IMN neg	87%	75%
Only Ax pos	68%	53%
Only IMN pos	64%	52%
Ax + IMN pos	54%	21%

<sup>4</sup>Urban J et al Am J Roentgen 1971;1:130-36

**IMN Status – Revisions in 6<sup>th</sup> Ed AJCC Staging Manual<sup>5</sup>**

- As noted above, INM status has been revised in the 6<sup>th</sup> edition of the AJCC staging manual. Several categories now exist based on the presence or absence of internal mammary disease.
  - pN1b – metastasis in IMNs with microscopic disease by SLND but not clinically apparent (at least Stage II).
  - pN1c – metastasis in 1 to 3 axillary nodes and in IMNs with microscopic disease by SLND but not clinically apparent (at least Stage II).
  - pN2b – metastasis in clinically apparent IMNs in the absence of axillary metastases (Stage III).
  - pN3b – metastasis in clinically apparent ipsilateral IMN in the presence of  $\geq 1$  positive axillary nodes; or in  $> 3$  axillary nodes and in IMNs with microscopic disease detected by SLND (Stage III)

## Treatment Options

- Several options exist for treating IMNs, including observation; removal of the ipsilateral IMN chain; removal of the IMN sentinel node if seen on preoperative lymphoscintigraphy; and addition of IMN field to whole breast or chest wall irradiation.
- In a lymphoscintigraphy study by Byrd et al, the investigators found that in patients with a positive sentinel node, almost all had at least an axillary sentinel node.<sup>6</sup>
- Location of the primary tumor was significant. A more recent study from MD Anderson also found that patients with positive axillary nodes and medial tumors, had a much higher chance ( $\leq 45\%$ ) of having positive IMNs. The investigators there concluded that “elective irradiation of the IM chain in breast carcinoma patients for lower quadrant or central tumors, and pathologically proven axillary node involvement is a reasonable treatment option.”<sup>7</sup>

## Radiation Therapy to the IMNs

- Although no randomized prospective trials show a survival benefit, there are good data to suggest that regional control is likely improved with radiation.
- Who to treat?
  - One approach is to limit therapeutic treatment to patients who have clinically apparent or SLN-positive IMNs.<sup>8</sup>
  - Not consensus exists on who should get prophylactic treatment. Potential candidates include all patients with medial primary tumors; all with medial primaries only with positive axilla; and all with IMN drainage by lymphoscintigraphy.

## Risks and Considerations in IMN SLND

- Dissection of the IMN is not risk-free and several issues need to be considered:
- Pneumothorax may occur secondary to violation of the pleura, although this is not generally considered likely to occur.
- Bleeding with difficult access to control hemorrhage is a potentially serious problem.
- Many patients require a separate incision, because the most common space involved is the second or third intercostal space, which is often higher, or away from the primary tumor site. Thus, there can be additional scarring and pain.
- The need for future cardiac reconstructive options or past revascularization procedures must be taken into account. Thus, patients with a prior CABG may be excluded as may patients who will likely require the use of the IM artery for CABG in the future.
- Increased cost and time in operating room and involvement of the nuclear medicine department, as the procedure requires peritumoral injection and time to visualization.
- Internal mammary node dissection requires communication with a nuclear medicine physician and marking of the appropriate intercostal space.
- In terms of the technical aspects of the procedure, readers are, referred to the article by Sacchini et al.<sup>9</sup>

## Summary

- Sentinel lymph node dissection for IMNs is not the standard of care outside of clinical trials.
- Sentinel lymph node dissection of the IMNs is technically feasible and safe, although it can add to morbidity.
- The pathologic stage of IMNs may change disease stage, but may not affect regional or systemic treatment.
- Current data are insufficient to select patients most appropriate to receive IM irradiation.

## Conclusions

- An interdisciplinary approach to the systemic or regional treatment of IMNs is needed to determine the role and technique of SLND
- The application of prophylactic IMN irradiation remains to be defined.
- Consideration of SLND or irradiation of IMNs is appropriate for medial hemispheric and lower outer primary tumors, especially when the axilla is positive.

## References

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