Significant Discordance of Lymphovascular Invasion between Breast Cancer Core Biopsies and Surgical Specimens Limits Its Role as a Tool for Preoperative Prediction of Nodal Metastases

INTRODUCTION

- Many breast cancer nomograms have been developed from resected tumor pathology, but are intended to be used preoperatively based on core biopsy results.
- Some nomograms use lymphovascular invasion (LVI) as a key criterion to predict the likelihood of sentinel node metastasis.
- We examined whether LVI on resected tumor pathology is accurately identified on core biopsy and whether there is a difference in the correlation of patients’ sentinel node status between core biopsy and resected tumor LVI.

METHODS

- We reviewed cases of invasive breast cancer from February 2011 to September 2014, excluding those with neoadjuvant chemotherapy, recurrent cancer, histology other than ductal/lobular/mixed, or stage IV disease.
- LVI was categorized as absent, present, or suspicious, as indicated in the pathology report, and compared on core biopsy vs. resected tumor.
- We compared the percentage of patients who had a positive sentinel node biopsy between negative, suspicious and positive LVI on core biopsy vs. resected tumor.

RESULTS

- We analyzed 614 cases for LVI discordance.
  - Of 147 cases with final LVI positive (resected tumor positive or suspicious, core biopsy positive), 76 (52%) were negative for LVI on core biopsy (Table).
  - Of cases suspicious for LVI on core biopsy, LVI status on resected tumor was negative in 45%.
  - When using core biopsy to define LVI, % of patients with positive sentinel nodes was not significantly different by LVI status.
  - When using resected tumor to define LVI, there was a stepwise increase in the likelihood of having a positive sentinel node.
  - The likelihood of having a positive sentinel node was significantly higher for those with positive vs. negative LVI on resected tumor (48.2 vs. 12.5%, p<.001).

| Lymphovascular invasion (LVI) on core biopsy vs. resected tumor (column percentages in parenthesis) and percentage of patients with positive (+) sentinel lymph nodes (SLN), with 95% confidence interval in parentheses | Resected tumor |
|---|---|---|---|
| Negative for LVI (n=477) | Suspicious for LVI (n=10) | Positive for LVI (n=127) | % of patients with + SLN |
| Core Biopsy | Negative LVI (n=510) | (91%) 434 | (60%) 6 | (55%) 70 | 17.3% (CI 14-21%)
| Suspicious for LVI (n=74) | (7%) 33 | (30%) 3 | (30%) 38 | 23% (CI 14-37%)
| Positive for LVI (n=30) | (2%) 10 | (10%) 1 | (15%) 19 | 27.8% (CI 11-54%)

| % of patients with + SLN | 12.5% (CI 10-16%) | 37.5% (CI 10-74%) | 48.2% (37-56%) |

CONCLUSIONS

- In some nomograms, the presence of LVI increases the probability of having a sentinel node metastasis by approximately 25%.
- Our study demonstrates that preoperative core biopsy missed the majority of cases of LVI which were considered positive on final surgical pathology.
- The percentage of patients with positive sentinel nodes was not significantly different between those with negative or positive LVI on core biopsy, however, it was significantly different between negative and positive LVI on resected tumor specimen.
- Postoperative data is often used to develop nomograms for preoperative use, on the assumption that the core biopsy information will correlate with the resected tumor.
- This study shows that LVI on core biopsy does not correlate well with resected tumor pathology, which translates into an inability to accurately predict sentinel node status preoperatively.