Accuracy of sentinel lymph node biopsy in large and multifocal/multicentric breast carcinoma - a systematic review

Spillane AJ, Brennan ME

CRD summary
This review concluded that, based on limited evidence, the success rate and false-negative rate of sentinel lymph node biopsy appeared to be similar in multifocal or multicentric breast cancers to small unifocal cancers. Small unifocal cancers were not part of this review and this, together with limitations in methods and reporting, mean that these conclusions may be unreliable.

Authors' objectives
To assess the accuracy of sentinel lymph node biopsy (SLNB) in women with large and multifocal or multicentric breast carcinoma.

Searching
MEDLINE was searched from inception to April 2010 and search terms were reported. The bibliographies of primary studies and reviews were screened for additional articles. Further studies were identified following advice from experts in the area.

Study selection
Eligible studies assessed SLNB performance in clinically node-negative women with invasive breast cancer. Studies reported outcomes separately for women with multicentric or multifocal tumours (either individually, or as a class multicentric/multifocal), or tumours with a diameter of 30 mm or less. Studies were required to have reported data on test accuracy (sensitivity/false negative rate and/or axillary recurrence) and at least one other outcome (success rate of sentinel lymph node identification or sentinel lymph node positivity rate). Studies that did not provide sufficient data to allow calculation of false negative rates and overall accuracy were not excluded. Studies that reported fewer than 20 cases of multifocal/multicentric or large tumours and studies of SLNB after neoadjuvant chemotherapy were excluded.

The reported mean or median age of women in the studies ranged fro 46 to 64 years. Mastectomy rates, where reported, ranged from 40 to 100% and rates of breast conserving surgery ranged from 9 to 78%. Studies used radiocolloid and/or blue dye for sentinel lymph node mapping.

The authors did not state how many reviewers selected studies for inclusion.

Assessment of study quality
The authors stated that "eligible studies were evaluated using quality criteria" but no further details were reported.

Data extraction
The following data were extracted, where reported: SLNB success rate; the number of sentinel nodes retrieved and the SLNB positive rate; number or axillary lymph node dissections; non-sentinel lymph node positive rate (when sentinel lymph node(s) were positive); sensitivity; false negative rate; negative predictive value; accuracy; and axillary recurrence rate.

Data were extracted independently by the two authors and any disagreements were resolved by consensus.

Methods of synthesis
Studies were combined in a narrative synthesis ad structured tables.

Results of the review
Twenty-six studies with a total of 24,248 sentinel lymph node biopsies (SLNB) were included in the review. Studies included 1,604 cases of multifocal/multicentric tumours and 1,912 larger tumours.
Multifocal tumours:

Six studies describing 314 cases reported separate data on the performance of SLNB in multifocal breast cancer. SLNB success rates ranged from 86% to 94%. Sentinel lymph node positivity rates were 42% to 59%. For the five studies that performed routine axillary lymph node dissection, sensitivity ranged from 67% to 100%, false negative rate ranged from 0 to 33% and overall accuracy ranged from 78% to 100%. The non-sentinel lymph node positive rate (following axillary dissection for positive SLNB) ranged from 16% to 50%; four studies.

Multicentric tumours:

Five studies describing 262 cases reported separate data on the performance of SLNB in multicentric breast cancer. SLNB success rates ranged from 92% to 100%. Sentinel lymph node positivity rates were 25% to 61%. For the three studies that performed routine axillary lymph node dissection, sensitivity ranged from 92% to 100%, false negative rate ranged from 4 to 8% and overall accuracy ranged from 96% to 100%. The non-sentinel lymph node positive rate (following axillary dissection for positive SLNB) ranged from 37% to 82%; five studies.

Multiple breast cancer (multicentric and multifocal combined):

Ten studies describing 996 cases reported data on the performance of SLNB for multicentric and multifocal breast cancer treated as one category. SLNB success rates ranged from 92% to 100%. Sentinel lymph node positivity rates were 12% to 63%. Sensitivity ranged from 86% to 100%, false negative rate ranged from 0 to 25% and overall accuracy ranged from 82% to 100%. The non-sentinel lymph node positive rate (following axillary dissection for positive SLNB) ranged from 32% to 51%; three studies.

Larger tumours:

Eleven studies describing 1,912 cases reported separate data on the performance of SLNB in larger tumours. SLNB success rates ranged from 86% to 100%. Sentinel lymph node positivity rates were 49% to 72%. Sensitivity ranged from 82% to 97%, false negative rate ranged from 3 to 18% and overall accuracy ranged from 85% to 98%. The non-sentinel lymph node positive rate (following axillary dissection for positive SLNB) ranged from 40% to 80%; three studies.

Authors' conclusions

There were limited data on the efficacy and safety of sentinel node-based management in multifocal/multicentric and larger tumours and there was heterogeneity of results in the available data. Based on limited evidence, success rate and false-negative rate appear to be similar to those for small unifocal cancers, but node positivity rates were higher and rates of non-sentinel lymph node positivity were very high when the sentinel node was positive.

CRD commentary

The review reported a research objective and defined inclusion criteria. The search strategy was limited to a single bibliographic database and reference screening in retrieved studies; it was therefore possible that relevant studies may have been missed. The data extraction process included measures to minimise error and/or bias, but it was not clear whether similar measures were applied to study selection. The authors stated "studies were evaluated using quality criteria", but no further details were reported. Details and results of studies were reported in full, and the decision to use a narrative synthesis to summarise results was appropriate.

The authors' conclusions were based on a comparison of the results from this review with performance of sentinel lymph node biopsy in small unifocal tumours (not part of their review). This, along with limitations in the review process and reporting, mean that these conclusions may not be reliable.

Implications of the review for practice and research

Practice: The authors stated that awareness of high node positivity rates, compared to those seen in small unifocal cancers, and very high rates of non-sentinel lymph node positivity when the sentinel node was positive, was essential when recommending SLNB based axillary management for these higher-risk tumours.

Research: The authors did not specify any recommendations for future research.
Funding
Friends of the Mater Foundation (Australia).

Bibliographic details

PubMedID
21292433

DOI
10.1016/j.ejso.2011.01.011

Original Paper URL
http://www.ejso.com/article/S0748-7983(11)00013-8/abstract

Indexing Status
Subject indexing assigned by NLM

MeSH
Axilla; Breast Neoplasms /pathology /surgery; Female; Humans; Lymph Node Excision; Lymph Nodes /pathology /surgery; Lymphatic Metastasis; Neoplasm Staging; Sensitivity and Specificity; Sentinel Lymph Node Biopsy

AccessionNumber
12011002785

Date bibliographic record published
14/09/2011

Date abstract record published
23/04/2012

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.