

From Axillary Dissection to Sentinel Node Biopsy: Three Decades Redefining Axillary Surgery in Early Breast Cancer — A Narrative Review

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Abstract

Introduction: Axillary lymph node dissection (ALND) has been the gold standard for axillary staging in breast cancer for over a century. The introduction of sentinel lymph node biopsy (SLNB) in the 1990s offered a minimally invasive alternative with comparable staging accuracy and significantly reduced morbidity. Multiple landmark randomized controlled trials have since demonstrated that completion ALND can be safely omitted in selected patients with positive sentinel lymph nodes without compromising oncologic outcomes. This narrative review aims to examine the evolution from ALND to SLNB, critically evaluate the landmark trials that shaped current practice, and discuss ongoing controversies and future directions in axillary management in early breast cancer.

Materials and Methods: A comprehensive literature search was performed using PubMed/MEDLINE, Scopus, and Web of Science databases. Search terms included "sentinel lymph node biopsy", "axillary lymph node dissection", "breast cancer", and "axillary management." Landmark randomized controlled trials, systematic reviews, meta-analyses, and current clinical practice guidelines were identified and reviewed.

Results: The NSABP B-32 trial validated SLNB as an accurate staging tool equivalent to ALND. The ACOSOG Z0011 trial demonstrated no survival benefit from completion ALND in patients with 1-2 positive sentinel lymph nodes undergoing breast-conserving surgery. The AMAROS trial demonstrated that irradiation of the axilla provides equivalent locoregional disease control compared to surgical dissection, while carrying a substantially more favorable morbidity profile. The IBCSG 23-01 trial confirmed that ALND can be omitted for sentinel node micrometastases. Most recently, the SENOMAC trial extended these findings to patients with 1-2 macrometastases in a broader population.

Conclusions: SLNB has become the established standard for axillary staging in early breast cancer with a clinically negative axilla, superseding ALND entirely. Progressive de-escalation of axillary surgery has been consistently supported by high-level evidence without compromising survival. Future research will determine the feasibility of further de-escalation, particularly after neoadjuvant chemotherapy.

Keywords: breast cancer, axillary lymph node surgery, sentinel lymph node biopsy, surgical de-escalation, ACOSOG Z0011