

Management of Axillary Disease



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KEYWORDS

- Breast cancer • Nodal metastasis • Sentinel lymph node
- Axillary lymphadenectomy • Neoadjuvant chemotherapy

KEY POINTS

- Accurate staging of the axillary lymph nodes is critical to defining prognosis and for planning therapy.
- In patients with clinically negative axillary lymph nodes, sentinel lymph node dissection (SLND) is the standard approach to surgically staging the axillary nodes and has been shown to be technically feasible and accurate in multi-institutional randomized studies.
- The ACOSOG Z0011 trial demonstrated that carefully selected clinically node-negative women undergoing breast conservation therapy who have 1 or 2 positive sentinel lymph nodes may safely omit axillary lymph node dissection (ALND) without impact on oncologic outcomes.
- SLND can be performed successfully after neoadjuvant chemotherapy in clinically node-negative patients and allows for a single surgical procedure for patients as well as a lower proportion of patients requiring ALND.
- ALND remains the standard approach for clinically node-positive patients who undergo neoadjuvant chemotherapy. Emerging data from trials such as the ACOSOG Z1071 study may soon change this practice.

INTRODUCTION

The presence of axillary lymph node metastases is the most significant predictor of cancer outcomes in breast cancer, and remains an important aspect of diagnosis and management of these patients.^{1–3} Nodal status is often the key determinant of extent of surgery as well as systemic therapy and radiation. In the past, women diagnosed with breast cancer underwent axillary lymph node dissection (ALND) in order to stage the axilla. The introduction of sentinel lymph node dissection (SLND) as a validated staging procedure allowed clinicians to gain the same information while minimizing morbidity with no difference in oncologic outcomes.⁴ Although all patients

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with positive lymph nodes underwent ALND in the past, recent data have changed this approach, and have allowed for highly selected women to omit ALND. Emerging data will potentially broaden this approach in growing populations of patients. Therefore, surgeons must be able to accurately assess the axillary nodes for the presence of metastases, delineate the extent of nodal disease, and understand the impact on oncologic outcomes in order to design operations that are effective but also minimize morbidity.

STAGING OF AXILLARY NODAL REGION

Physical examination of breast cancer patients should always include specific attention to the regional nodal basins such as the axillary, infraclavicular, and supraclavicular regions. When axillary adenopathy is noted, clinicians should record the size of the palpable lymph node as well as whether the nodes feel matted together. Unfortunately, physical examination is not sensitive or specific, as involved nodes may not be palpable, and palpable nodes may actually be reactive, especially after breast biopsies. The false-negative rate for physical examination is as high as 45% in some series.⁵ For this reason, clinical examination is complemented by nodal ultrasonography. Axillary lymph nodes can be assessed for features associated with malignancy such as enlarged size, thickened or eccentric cortex, or compression of the fatty hilum.⁶ Suspicious nodes routinely undergo fine needle aspiration (FNA) or core biopsy to provide pathologic confirmation of involvement with a subsequent sensitivity of 86% to 89% and specificity as high as 100%.^{7,8} This information can then be used in designing a treatment plan.

The American Joint Committee on Cancer (AJCC) staging classification has different parameters for nodal staging based on clinical versus pathologic evaluation.³ Clinically identified axillary lymph nodes (either by examination or imaging studies) are designated as N1 if they are in the ipsilateral nodal basin and are mobile, or N2 if they are fixed or matted to each other or other structures. Contralateral axillary metastases are classified as distant metastases. The pathologic staging system has more variation. Metastases that are less than or equal to 0.2 mm are classified as isolated tumor cells and are designated as pN0(i+). Metastases in 1 to 3 axillary lymph nodes are categorized as N1, with a designation of "mi" if the metastases are micrometastases (>0.2 mm but ≤2 mm). Involvement of 4 to 9 axillary lymph nodes is staged as pN2, and at least 10 involved nodes are defined as pN3.

CLINICALLY NODE-NEGATIVE PATIENT

SLND Technique

SLND is based on the concept that the breast has an orderly pattern of lymphatic drainage, with specific lymph nodes, or sentinel nodes, that drain the breast first, followed by drainage to the remaining nodal basin. This idea was first reported by Braithwaite over 100 years ago after observing the lymphatic drainage pattern of a gangrenous appendix. The first clinical applications were presented in the 1970s for penile cancer, although the technique did not become widely used because of its difficulty.⁹ In the early 1990s, a more feasible technique was created for melanoma that allowed for widespread implementation into practice.¹⁰ Before this point, women standardly underwent ALND for staging of axillary nodes, with the associated morbidities of the procedure including functional deficits, chronic pain, and development of lymphedema. Unfortunately, many of these patients had no nodal metastases and thus suffered the morbidities without an oncologic benefit. Thus there was tremendous interest in applying the technique to breast cancer patients. SLND was quickly

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