Management of the Axilla in the Patient with Breast Cancer

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KEYWORDS

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

KEY POINTS

- Axillary nodal disease burden, which is critical to multidisciplinary treatment decision making, can be predicted with physical examination and axillary ultrasound and with fine-needle aspiration of suspicious-appearing nodes.
- Completion of axillary lymph node dissection may be omitted in select clinically node-negative patients undergoing breast-conserving surgery found to have 1 or 2 positive lymph nodes on sentinel lymph node dissection.
- Emerging data suggest that avoiding axillary node dissection may be appropriate in clinically node-positive patients who receive neoadjuvant chemotherapy.

INTRODUCTION

The presence of nodal metastasis is a key prognostic predictor in breast cancer with significant impacts on treatment planning.[1–3] The nodal status often determines the need for systemic therapy, the extent of surgery, reconstruction options, and the need for radiation after mastectomy. Historically, patients diagnosed with breast cancer underwent axillary node dissection (ALND) to stage the axilla. Advancements in diagnostic imaging and surgical technique, however, now allow for nonsurgical or minimally invasive approaches that help clinicians attain the same information with reduced morbidity. Beyond diagnosis, the use of ALND as a therapeutic modality has been re-examined, with the recognition that all patients with nodal disease may not require extensive axillary surgery. In the modern era, surgeons must have a thorough understanding of the impact of axillary disease on multidisciplinary therapy and surgical planning.

STAGING OF THE AXILLARY NODAL REGIONS

Nodal staging in breast cancer patients begins with physical examination of regional nodal basins, including axillary, infraclavicular, and supraclavicular regions. When

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axillary adenopathy is identified, the clinician should take care to determine the size of palpable nodes and whether they appear to be matted. Unfortunately, physical examination is impacted by body habitus, making it highly unreliable with a false-negative rate (FNR) as high as 45%.[4] Because of this, ultrasound (US) has emerged as the preferred technique for nodal assessment before therapy. One benefit of US is that abnormal nodes can be assessed in the same setting with needle biopsy to allow for pathologic confirmation of disease. In a study from the authors' institution, axillary US with fine-needle aspiration (FNA) of abnormal nodes was found to have a sensitivity of 86.4%, specificity of 100%, and negative predictive value of 67%. The sensitivity increased to 93% in patients with metastatic deposits measuring greater than 5 mm compared with 44% when the largest focus was less than 5 mm.[5] In 1 study of 115 cases, the investigators reported on FNAs done by palpation alone (n = 66) and those done under US guidance (n = 49). The overall sensitivity was 65%; however, the sensitivity was higher (88%) in patients undergoing ALND, where the median metastatic focus was 1.5 cm, compared with a sensitivity of 16% in patients undergoing sentinel lymph node dissection (SLND), where the median focus was 0.25 cm. The investigators reported that 81.5% of the false-negative cases occurred when the metastatic focus was less than 1 cm.[6] Current National Comprehensive Cancer Network (NCCN) guidelines recommend pathologic confirmation of clinically palpable nodes using US-guided needle biopsy. As discussed later, there are also now recommendations to place clips to mark nodes with biopsy-confirmed disease.[7]

The American Joint Committee on Cancer staging system includes nodal staging based on clinical and pathologic evaluation.[3] Clinical staging includes nodes detected by examination or imaging and defines N1 as mobile ipsilateral level I and level II axillary lymph nodes; N2 as matted ipsilateral level I and level II nodes or clinically detected ipsilateral internal mammary node in the absence of level I or level II adenopathy; and N3a as ipsilateral infraclavicular (level III) adenopathy. If level I or level II adenopathy is present along with disease in ipsilateral internal mammary, it is categorized as N3b. Supraclavicular lymphadenopathy is defined as N3c. Pathologic LN staging is based on the location of involved nodes and the number.[8]

CLINICALLY NEGATIVE LYMPH NODE

Sentinel Lymph Node Dissection

The introduction of SLND for axillary staging in breast cancer was one of the most important contemporary advances in care, allowing for accurate staging while minimizing morbidity. Prior to the advent of SLND, patients routinely underwent ALND, thus exposing them to the risks of lymphedema, chronic pain, and sensory deficits.[9,10] Many of these patients did not have nodal metastasis yet suffered from the side effects of the surgery without oncologic benefit. SLND was first introduced for melanoma in the early 1990s,[11] however was quickly also validated for the use in breast cancer.[12–14] SLND is based on the concept that there is a specific drainage pattern for lymphatics of the breast. Evaluation of the sentinel nodes, or the first draining nodes for the breast, can predict the status of the remaining nodes.

There are now long-term survival data comparing SLND with ALND in patients with clinically node-negative breast cancer. In the National Surgical Adjuvant Breast and Bowel Project (NSABP) B-32 trial, 5611 patients were randomized to SLND plus ALND (group 1) or SLND with ALND only if positive nodes were identified (group 2) to assess oncologic outcomes. There were no differences seen in disease-free (82.4% vs 81.5%) or overall survival (91.8% vs 90.3%) rates at 8 years. The investigators concluded that SLND alone was an appropriate therapy when SLNs showed no