



Beyond Detection: Axillary Ultrasound as a Gatekeeper to Surgical De-escalation

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Dear Editor,

Axillary management in early breast cancer is evolving rapidly. ACOSOG Z0011 demonstrated that axillary lymph node dissection can be omitted in selected patients with limited sentinel-node metastasis. More recently, SOUND and INSEMA advanced de-escalation by showing that sentinel lymph node biopsy (SLNB) itself can be omitted in carefully selected patients without compromising intermediate-term oncologic outcomes (1-4). Reflecting this evidence, the 2025 ASCO guideline recommends omitting routine SLNB in selected postmenopausal women aged 50 years or older who have small, grade 1 or 2, hormone receptor-positive/HER2-negative tumors, a negative preoperative axillary ultrasound, and planned breast-conserving therapy, provided that nodal information would not change treatment (4). Collectively, these changes assign axillary ultrasound a new role: it is no longer simply an adjunct to staging but a potential gatekeeper for surgical de-escalation.

This shift also changes how the performance of axillary ultrasound should be interpreted. Traditionally, ultrasound performance has been assessed against pathology using sensitivity, specificity, positive predictive value, and negative predictive value, with every missed metastatic deposit considered a diagnostic failure. However, SOUND illustrates why this standard may be too narrow: 13.7% of patients assigned to SLNB had pathologically positive nodes despite a negative preoperative ultrasound, yet 5-year distant disease-free survival remained noninferior when axillary surgery was omitted, and axillary recurrence was very low (2). INSEMA

reached a similar clinical conclusion, reporting noninferior invasive disease-free survival without axillary surgery, along with less lymphedema, better arm mobility, and less pain with movement (3). These results, however, apply to a carefully selected population and should not be interpreted as evidence that a negative ultrasound excludes nodal metastasis. SOUND included patients with tumors ≤ 2 cm, a negative axillary ultrasound, and planned breast-conserving surgery with radiotherapy. Fine-needle aspiration was permitted for a single doubtful node, whereas patients with multiple doubtful or suspicious nodes were excluded (2). ASCO defines selection even more explicitly, allowing one suspicious node only when biopsy findings are benign and concordant (4). Axillary ultrasound should therefore be interpreted in the context of the treatment decision rather than as a stand-alone diagnostic test.

Recent studies also indicate why a single ultrasound threshold is unlikely to serve every clinical purpose. Heidarzadeh et al. evaluated criteria designed to maximize specificity and reported approximately 95% specificity for a cortical thickness of about 6 mm, 100% specificity for a marked difference in cortical thickness relative to contralateral axillary lymph nodes, and approximately 94% specificity when increased cortical thickness was observed in multiple nodes (5). Aghebati et al., in a recent article in the International Journal of Cancer Management, examined the other side of this trade-off: broadening the definition of sonographic positivity from unequivocally malignant lymph nodes to include mildly suspicious nodes increased sensitivity from 44.68% to 61.19% but reduced specificity from 81.11% to 60.83% (6). These studies

are not contradictory; together, they show that the appropriate threshold depends on the clinical question.

For radiologists, this evidence supports a management-oriented interpretation rather than a simple positive-or-negative label. A confidently negative axilla may support omission of SLNB, but only when the patient also meets validated clinical and tumor selection criteria. An isolated indeterminate node should not automatically lead to more extensive surgery. Targeted needle sampling may be appropriate if the result determines eligibility for de-escalation (4, 7). Conversely, a round hypoechoic node with hilar effacement, marked cortical abnormality, or multiple suspicious nodes should raise concern for nodal disease substantial enough to change management. Such findings should generally prompt tissue confirmation and multidisciplinary discussion, rather than an assumption that the surgery-omission trial results apply. Standardized frameworks such as the NAUTILUS imaging protocol are valuable because they link morphology directly to eligibility, incorporating cortical thickness, hilar appearance, nodal shape, and image-guided biopsy of selected equivocal nodes (8).

As ultrasound assumes this gatekeeping role, reproducibility becomes a patient-safety issue. In a study of 611 patients, Riedel et al. reported a sensitivity of 53.3% and specificity of 93.6% for routine ultrasound; systematically applying previously recommended criteria did not improve diagnostic accuracy (9). Cortical thickness greater than 3 mm remains a useful suspicious feature, but in the prospective study by Stachs et al., it yielded a sensitivity of 66.7% and specificity of 74.6%, underscoring that cortical thickness alone cannot define clinically meaningful nodal burden (10). Reports should therefore identify the most suspicious node; describe whether the cortical abnormality is focal or diffuse; provide the cortical measurement; note hilar preservation or effacement and nodal shape; and record the number of abnormal nodes. Finally, de-escalation criteria developed largely in patients undergoing upfront surgery should not be applied uncritically to those receiving neoadjuvant systemic therapy, because post-treatment nodal appearance makes ultrasound-pathology correlation more difficult (6, 11).

We therefore suggest reframing the central research question. Rather than asking only, "Can ultrasound detect nodal metastasis?" we should ask, "Can ultrasound reliably identify patients who do not need pathological nodal staging while still recognizing nodal disease likely to change management?" Prospective multicenter studies should validate sonographic categories linked to management, establish acceptable false-negative rates for nodal disease that would alter treatment, and account for tumor biology and treatment intent.

In conclusion, axillary ultrasound is unlikely to replace SLNB on the basis of a single diagnostic cutoff. Its greater value may lie in identifying patients in whom surgical nodal staging would not change management.

Footnotes

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