Use of Axillary Staging in the Management of Ductal Carcinoma In Situ

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Owing to the widespread adoption of screening for breast cancer and improvements in the sensitivity of mammography, the diagnosis of ductal carcinoma in situ (DCIS) has increased dramatically over the past few decades. Historically, DCIS accounted for only 1% to 2% of all breast cancer diagnoses, but now it accounts for over 20%.

Until the early 1990s, mastectomy was the standard surgical treatment for DCIS, and axillary lymph node dissection (ALND) was routine. Simultaneously with the rapid increase in diagnosis of DCIS in the 1980s and early 1990s, the use of breast-conserving surgery (BCS) for DCIS became more widely used. The use of axillary staging decreased as DCIS became more frequently diagnosed and more commonly treated with BCS.

Sentinel lymph node biopsy (SLNB) for invasive breast cancer was first reported in 1993 by Krag et al., and was validated in dozens of institutions in the late 1990s. Because validation studies demonstrated low false-negative rates with SLNB, the technique became adopted by many in the 2000s, long before publication of randomized trials comparing outcomes with SLNB vs conventional ALND. With the adoption of SLNB for invasive breast cancer came its use for women with DCIS.

In this issue of JAMA Oncology, Coromilas et al report the patterns of axillary evaluation over time from 2006 to 2012 in a large cohort of women with DCIS, capturing about 15% of patients in the United States during that time period. They note that their population was largely drawn from small, urban, nonteaching hospitals in the South. The procedures were performed by general surgeons (only 4.7% were performed by surgical oncologists). They found that there was statistically significant variation in the use of nodal assessment (either SLNB or ALND) when they examined numerous demographic, hospital, and surgeon characteristics.

The authors found that a much larger proportion of women who had mastectomy underwent nodal evaluation compared with those undergoing BCS (63% vs 18%). This is reassuring, although the proportions undergoing nodal evaluation are not consistent with current guidelines. Both National Comprehensive Cancer Network (NCCN) and American Society of Clinical Oncology (ASCO) guidelines recommend SLNB for those undergoing mastectomy to allow staging of the axilla in case invasive cancer is found in the breast, since mapping of the breast is no longer feasible after the breast is removed. In contrast, nodal evaluation is not generally recommended for women undergoing BCS, with 3 exceptions: (1) cases in which an excision was performed in a location that would compromise the subsequent performance of SLNB; (2) those diagnosed by core biopsy but with a large area of DCIS; and (3) those with a suspect mass found on examination or imaging.

Among women undergoing mastectomy, the use of ALND decreased over time, consistent with the shift from ALND to SLNB as the standard axillary staging procedure. However, it is surprising that even as late as in 2012, 11% of women underwent ALND. It is noteworthy that only 5% of mastectomies were performed by high-volume surgeons (more than an average of 2.7 cases annually); 95% of mastectomies were performed by surgeons that operated only once or twice a year for DCIS. Such surgeons would likely be among the slowest to change their practice patterns because patients with DCIS made up such a small fraction of their practice. The technique of SLNB requires training and experience and also requires some institutional support if radioactive tracer is used. These low- and mid-volume surgeons slowly did decrease their use of ALND and increase their use of SLNB, such that by 2012, most women undergoing mastectomy (57%) had SLNB. This falls far short of the general recommendation that women undergoing mastectomy for DCIS use a SLNB.
Among women undergoing BCS, the use of ALND was infrequent in 2006 (1.2%) and fell further by 2012 (0.3%).\(^5\) The use of SLNB was stable or slightly decreasing over time. On multivariable analysis, only low-volume surgeons and nonteaching hospitals were associated with the greater use of nodal assessment, suggesting that such surgeons are less aware of or less able to adopt current recommendations.

A limitation of this analysis is that the authors combined ALND and SLNB for the analysis. This makes interpretation difficult, since SLNB is recommended for those undergoing mastectomy, whereas ALND is not, and SLNB may be appropriate in some cases of BCS, whereas ALND is not.

Another limitation is that specific information regarding patient presentation is not available. While axillary evaluation in a woman undergoing BCS is not generally recommended, approximately 25% of women with DCIS diagnosed on core biopsy will have invasive cancer found at excision.\(^6\) Because of this, guidelines do recommend performing SLNB if the suspicion for invasive cancer is high (for example, presentation as a mass on examination or on mammogram). It would be helpful to understand what proportion of the 17% of women undergoing BCS and SLNB had such a presentation. It is possible that a significant proportion of women with a presentation suggestive of invasion were saved a second operation because invasion was found but an SLNB had already been performed at the first operation. For women in whom the suspicion of invasion is high, the morbidity and extra expense of doing the SLNB at the time of BCS must be balanced against that of a second operative procedure if invasive cancer is found.

The management of breast cancer has undergone a radical transformation over the past few decades, and its evolution is continuing. Axillary surgery has become markedly less aggressive and morbid over the past 20 years. Coromilas and colleagues\(^5\) have shed some light on how the changes in recommended practice have been adopted in a broad sample of hundreds of predominantly small, urban, nonteaching hospitals across the country and by general surgeons who infrequently treat women with DCIS.

**ARTICLE INFORMATION**

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