

SUBMITTED EDITORIAL

Breast cancer - the optimal design of radiation fields for patients with positive sentinel lymph nodes who do not undergo axillary lymph node dissection

Axillary lymph node dissection (ALND) has been part of breast cancer surgery since the description of the radical mastectomy and identifies nodal metastases and maintains regional control, but its contribution for survival is controversial¹. The recognition of the complexity of tumor biology has changed cancer treatment with more liberal use of systemic therapy to treat occult cancer cells wherever they may be in the body. Consequently, the decision to administer systemic therapy is influenced by a variety of patient- and tumor-related factors, with lymph node tumor status influencing but not necessarily dictating the use of chemotherapy².

Earlier interventions in breast cancer have reduced the incidence of lymph nodes metastases and even the number of tumor-involved lymph nodes. These observations have raised the question of the need of ALND. A review of Surveillance, Epidemiology, and End Results (SEER) data has shown that the use of ALND has decreased in recent years³.

At the end of 2011 there was the publication of the results of the Z0011 trial, which had the primary aim to determine the effects of ALND on overall survival in patients with positive sentinel lymph node (SLN) metastases treated in the contemporary era with lumpectomy, adjuvant systemic therapy, and tangential-field radiation therapy. Their results demonstrated equivalent survival in patients with breast cancer and one to two positive sentinel lymph nodes who were randomly assigned to sentinel lymph nodes biopsy alone or followed by ALND⁴.

Although the standard of care for patients with positive SLN has been complete ALND with breast-conserving surgery followed by systemic therapy and whole-breast irradiation with tangential fields, regional nodal irradiation was not allowed in Z0011. Surprisingly, this trial showed that the regional recurrence rate with no further dissection after positive SLN was found to be less than 1%, while it was expected to be at least 30%⁵.

Historically, the arrangement of treatment fields for breast cancer has relied on ALND findings. The number of positive nodes provides information concerning the risk of involvement of level III and/or supraclavicular nodes. When this risk is clinically relevant, radiation oncologists commonly treat the level III/supraclavicular region with a supraclavicular field⁶. Typically, this is used for patients with more than three positive nodes or other adverse features. With computed tomography-based planning, this involves contouring level I through III nodes, which ensures adequate radiation to the target nodes that are at risk.

With the recent publication of Z0011, the optimal design of radiation fields for patients with positive SLN who do not undergo ALND is uncertain.

The radiation tangential fields that are used to treat the breast is known to deliver radiation to the lower axilla, and as shown in our last publication in this journal⁷, a large component of levels I and II are encompassed by the tangential fields. Our results, as others^{8,9} have shown that patients treated with either bidimensional or tridimensional radiotherapy have an adequate coverage of the anatomic axillary level I-II, which is likely to have contributed significantly to disease control in Z0011.

It is also important to note that If SLN biopsy is to replace ALND in breast cancer treatment that it must be as accurate in determining preoperative axillary status, and even with negative SLN, there may be the phenomenon of alternative routing.

Finally, there is only limited published data on the long-term effects of SLN biopsy without associated ALND and there are no prospective data with respect to the optimal radiation approaches for patients with positive SLN who do not undergo ALND, which points to a large field for research in this area.

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