Letter to the Editor

Will Radiomics Replace Sentinel Lymph Node Biopsy?

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Dear Editor,

Axillary lymph node metastasis is by far the most vital determinant of survival for breast cancer patients (1). Sentinel lymph node biopsy (SLNB) is the gold standard for axillary lymph node staging in clinically node-negative patients. However, despite the reported high sensitivity (44%–100%) and specificity (100%) of SLNB (2), it is associated with multiple morbidities, including sensory impairment, motor dysfunction, and lymphedema (3).

Radiomics is a new type of specialized artificial intelligence that extracts specific features from medical images to construct a disease-specific model, known as a radiomics signature, that is then used to predict disease status in other images (4). Radiomics workflow can be summarized in four cardinal steps: manual or automatic segmentation; feature extraction with specialized tools; selection of the most relevant features using machine learning methods; and radiomics analysis to build the predictive model (4).

Many studies have used radiomics to predict axillary lymph node status in breast cancer patients. Magnetic resonance imaging, computed tomography, and mammography are usually used as the image sources to build the predictive model. The results of radiomics are promising, with an accuracy, sensitivity, and specificity as high as 98% (5).

Although radiomics shows high accuracy in predicting axillary lymph node metastasis, it is not expected to replace SLNB in the near future. This is because the evidence from current radiomics studies is of modest quality. To date, almost all radiomics studies are retrospective in design and lack comparison with the gold standard. Moreover, most of the studies lack external validation and cost-effectiveness analysis.

We believe that replacing SLNB with radiomics in axillary lymph node staging in breast cancer is possible and will spare millions of patients unnecessary surgical interventions. However, implementing radiomics in breast cancer care requires robust evidence from randomized controlled trials. Whether or not the current evidence from the retrospective studies justifies clinical trials is yet to be determined. The answer to this question may be solved by conducting a meta-analysis of the existing literature.

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