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RE: Identification of Preoperative Magnetic Resonance Imaging Features Associated with Positive Resection Margins in Breast Cancer?

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Dear Editor:

With great interest, we read the article "Identification of preoperative magnetic resonance imaging features associated with positive resection margins in breast cancer: a retrospective study" by Kang et al. (1). We would like to thank the authors for this highly useful work, which raises a few points worthy of discussion.

Discrimination and calibration have been two major components in the evaluation of model performance (2). Model building strategies commonly rely on an Events Per Variable (EPV) criterion to determine the minimal sample size required and the maximum number of candidate predictors that can be examined (3, 4). A very small ratio of EPV can affect the accuracy and precision of the regression coefficients and the tests of their statistical significance (5). In this work, the multivariate logistic regression prediction model (EPV = 5.2) included at least 6 variables (univariate analysis: tumor size $p = 0.015$, multifocality $p = 0.047$, size on magnetic resonance $p = 0.048$, patterns of enhancing lesions $p < 0.001$, distribution $p = 0.024$, and breast parenchymal enhancement $p = 0.087$; sample size = 120, events = 31). Additionally, the model confirmed that patterns of enhancing lesions (non-mass enhancement with or without mass) and distribution (segmental distribution) were predictors of positive resection margins. The results should be interpreted with caution (low EPV may lead to an overfitting of the model). Therefore, higher EPV (EPV ≥ 10) is recommended to fit prediction models in clustered data using logistic regression (4, 5). Further study with a large cohort is required. We thank the authors for their insights on this important problem.

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