

A nomogram to predict brain metastases of resected non-small cell lung cancer patients

Fanrong Zhang (Cancer Research Institute, Zhejiang Cancer Hospital & Key Laboratory Diagnosis and Treatment Technology on Thoracic Oncology of Zhejiang Province, China), Weihui Zheng (Cancer Research Institute, Zhejiang Cancer Hospital & Key Laboratory Diagnosis and Treatment Technology on Thoracic Oncology of Zhejiang Province, China), Lisha Ying (Cancer Research Institute, Zhejiang Cancer Hospital & Key Laboratory Diagnosis and Treatment Technology on Thoracic Oncology of Zhejiang Province, China), Junzhou Wu (Cancer Research Institute, Zhejiang Cancer Hospital & Key Laboratory Diagnosis and Treatment Technology on Thoracic Oncology of Zhejiang Province, China), Shaoyuan Wu (School of Life Sciences, Jiangsu Normal University, China), Shenglin Ma (Department of Radiation Oncology, Hangzhou First People's Hospital, China), Dan Su (Cancer Research Institute, Zhejiang Cancer Hospital & Key Laboratory Diagnosis and Treatment Technology on Thoracic Oncology of Zhejiang Province, China)

BACKGROUND: Brain metastasis is a major cause leading to the failure of treatment management for non-small cell lung cancer (NSCLC) patients.

HYPOTHESIS: The goal of this study is to establish an effective nomogram for prediction of brain metastases of resected NSCLC patients.

METHODS: We retrospectively investigated 637 operable NSCLC patients who received treatment at Zhejiang Cancer Hospital, China. Cox proportional hazards regression model was performed to identify significant risk factors, and a nomogram was developed for predicting 3-year and 5-year brain metastases rates.

RESULTS: Multivariate analysis identified four independent risk factors: neuron specific enolase (NSE), histological type, number of metastatic lymph nodes and tumor grade, and a nomogram was developed based on these factors. The effectiveness of the nomogram was validated using internal bootstrap resampling approach, showing that the nomogram exhibited sufficient level of discrimination according to the C-index (0.74, 95% CI: 0.67-0.82). The nomogram developed in this study demonstrated its discrimination capability for predicting 3-year and 5-year occurrence of brain metastases, and can be used to identify high-risk patients.