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Developing Nomograms Based On Multicenter Database To Predict Oncologic Outcomes In Patients With Extrahepatic Cholangiocarcinoma Undergoing Curative Resection

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Background : The tumor-node-metastasis (TNM) staging system is an only way to predict the prognosis of bile duct cancer. This study aims to develop nomograms to predict oncologic outcomes in patients with extrahepatic cholangiocarcinoma (EHCCC) undergoing curative resection.

Methods : The medical records of patients who underwent segmental resection (SR) of bile duct or pancreatoduodenectomy (PD) from January 2010 to December 2018 at Severance Hospital were used for model development. Data from Samsung Medical Center were utilized for external validation.

Results : Data from 331 patients were used for model development and data from 439 patients were utilized for external validation. The nomogram for predicting disease-free survival (DFS) was developed with 9 risk factors based on multivariable analysis as follows: R0 status (no/yes), adjuvant chemotherapy (no/yes), number of metastatic lymph node, lymphovascular invasion (no/yes), perineural invasion (no/yes), cell differentiation (well or moderate/poor), preoperative serum carbohydrate antigen (CA) 19-9 level (〈48.5/≥48.5U/mL), preoperative carcinoembryonic antigen (CEA) level (〈5/≥5ng/mL), and performed surgery (SR/PD). The nomogram for predicting overall survival (OS) was created based on 8 risk factors as follows: R0 status (no/yes), number of metastatic lymph node, cell differentiation (well or moderate/poor), preoperative CA19-9 level (〈48.5/≥48.5U/mL), preoperative CEA level (〈5/≥5ng/mL), age (〈70/≥70years), and the amount of intraoperative blood loss (〈450/≥450mL). Model performance was assessed for discrimination and calibration. The calibration plot showed good agreement between actual and predicted survival probabilities; The Harrell's C index of predictive ability for DFS and OS were 0.698 and 0.704 respectively. In the external validation set, the Harrell's C index for DFS and OS were 0.640 and 0.686 respectively.

Conclusions : The developed nomogram had acceptable accuracy and is useful for predicting the prognosis of EXCCC.

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