Topic : Biliary & Pancreas

INTEGRATION OF MULTIPLE PREOPERATIVE SERUM BIOMARKERS USING DECISION TREE ANALYSIS ENHANCES OUTCOME PREDICTION IN RESECTABLE GALLBLADDER CANCER

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Background : Current prognostic assessment for gallbladder cancer (GBC) relies heavily on postoperative pathological findings. This study aimed to develop practical preoperative risk stratification models using readily available biomarkers to predict surgical outcomes in resectable GBC.

Methods : A retrospective analysis included 308 patients undergoing curative resection for GBC across two hepatobiliary centers (discovery cohort: n=216; validation cohort: n=92). Decision tree models incorporating preoperative biomarkers were developed through classification and regression tree analysis. Model performance underwent evaluation using C-index calculation and calibration plots.

Results : The overall survival model identified CEA, CA12-5, and total bilirubin as key determinants, while CEA, CA19-9, and total bilirubin proved crucial for recurrence-free survival prediction. In the validation cohort, the models effectively stratified patients into distinct risk groups with significantly different 3-year overall survival rates (81.0%, 67.1%, and 0% for low-, intermediate-, and high-risk groups; P<0.001) and recurrence-free survival rates (82.9%, 48.1%, and 0%, respectively; P<0.001). Model performance remained robust across various clinical subgroups, demonstrating excellent calibration (integrated Brier score: 0.236 for overall survival, 0.280 for recurrence-free survival).

Conclusions : These novel decision tree models effectively stratify patients with resectable GBC into distinct prognostic groups using readily available preoperative biomarkers. Integration with clinical parameters enables more accurate risk assessment, potentially facilitating individualized treatment strategies and improving patient selection for surgical intervention.

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