

ROLE OF HEPATOBILIARY SCINTIGRAPHY IN PREDICTING POST-HEPATECTOMY LIVER FAILURE: A SINGLE-CENTER COHORT STUDY

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Background : Post-hepatectomy liver failure (PHLF) significantly impacts outcomes after liver resection. This study evaluates indocyanine green retention rate (ICGR15) and hepatobiliary scintigraphy (HBS) with 99mTc-mebrofenin for PHLF prediction.

Methods : This single-center retrospective cohort study included 58 patients who underwent liver resection between March 2022 and July 2024. Preoperative assessments included ICGR15, HBS, and laboratory tests. The primary outcome was PHLF, classified according to the International Study Group of Liver Surgery (ISGLS) criteria. Predictive performance was analyzed using receiver operating characteristic curves and multivariate logistic regression.

Results : PHLF occurred in 7 patients (12.1%). ICGR15 >15% and pre-HBS<13 were independently associated with PHLF, with adjusted odds ratios (aOR) of 3.4 (95% CI, 1.5-7.8) and 2.9 (95% CI, 1.3-6.5), respectively. Combined assessment of ICGR15 and HBS improved predictive accuracy (AUC: 0.82) compared to ICGR15 alone (AUC: 0.76) or HBS alone (AUC: 0.74). High negative predictive values (NPV) of ICGR15 (0.95) and HBS (0.97) highlighted their utility in identifying low-risk patients. The risk of PHLF increased significantly with the number of risk factors present, reaching 42.9% in patients with three or more risk factors ($P < 0.001$).

Conclusions : Hepatobiliary scintigraphy with 99mTc-mebrofenin complements ICGR15 in predicting PHLF, with their combination providing superior predictive performance. High NPVs underscore the utility of these tools in identifying low-risk surgical candidates. These findings support integrating HBS into preoperative protocols for major liver resections to improve risk stratification and surgical outcomes.

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