Liver imaging reporting and data system category on magnetic resonance imaging predicts recurrence of hepatocellular carcinoma after liver transplantation within the Milan criteria: a multicenter study

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Background: This study aimed to investigate the association between Liver Imaging Reporting and Data System (LI-RADS) category and recurrence of hepatocellular carcinoma (HCC) after primary liver transplantation (LT) within the Milan criteria.

Methods: This multicenter retrospective study included 140 recipients who underwent living donor LT (LDLT) for treatment-naïve HCC and pretransplant contrast-enhanced magnetic resonance imaging (MRI) between 2009 and 2013. LI-RADS categories were assigned using LI-RADS version 2018. Recurrence-free survival (RFS) and associated factors were evaluated using Cox proportional hazards regression analysis, Kaplan-Meier analysis, and log-rank test. Histological grading and microvascular invasion (MVI) were analyzed on the pathologic examinations of explanted livers.

Results: The overall 1-, 3-, 5-, and 7-year RFS rates were 95.6%, 92.6%, 90.2%, and 89.3%, respectively. In the multivariable analysis, independent predictors of recurrence included HCCs categorized as LR-M (hazard ratio [HR], 18.68; 95% confidence interval [CI], 5.79–60.23; $P < 0.001$) and the largest tumor size of ≥ 3 cm on MRI (HR, 4.18; 95% CI, 1.42–12.37; $P = 0.010$). The 5-year RFS rate was significantly lower in patients with HCCs categorized as LR-M than in those with HCCs categorized as LR-5 or 4 (LR-5/4) (36.9% vs. 95.8%, respectively; $P < 0.001$). HCCs categorized as LR-M exhibited significantly more MVI than HCCs categorized as LR-5/4 (57.1% vs. 17.5%, respectively; $P = 0.002$).

Conclusions: Patients with HCCs categorized as LR-M using LI-RADS version 2018 may have a worse prognosis after primary LT within the Milan criteria than those with HCCs categorized as LR-5/4.

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