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Graft Size and Hepatocellular Carcinoma Outcomes in Adult-to-Adult Living Donor Liver Transplantation: KOTRY study

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Introduction:

To assess the association between graft-to-recipient weight ratio (GRWR) in adult-to-adult living donor liver transplantation (LDLT) and hepatocellular carcinoma (HCC) recurrence.

Methods: Data for patients who underwent LDLT for HCC between 2014 and 2020 were retrospectively reviewed in the Korean Organ Transplantation Registry (KOTRY) registry. Patients were matched at a 1:3 ratio using propensity score, according to the cutoff of graft-to-recipient weight ratio (GRWR) for HCC recurrence determined by adjusted cubic spline (GRWR<0.7% vs. GRWR 0.7%). Primary outcome was HCC recurrence and secondary outcome was overall survival (OS). In addition, competing-risk analysis through the Fine and Gray method was utilized aiming to assess the association between GRWR and HCC recurrence in entire cohort.

Results: LDLT was performed in 1321 patients (n=43, GRWR<0.7 vs n=1278, GRWR 0.7). In the matched cohort, one, three- and five-years OS were 77.1%, 74.3% and 74.3% in the group with GRWR<0.7, compared to 94.5%, 87.4% and 87.4% in the group with GRWR 0.7 (p=0.038) and one, three- and five-years OS were 94.4%, 80.3%, and 80.3% in the group with GRWR<0.7, compared to 98.9%, 94.6%, and 92.7% in the group with GRWR 0.7 (p=0.041). In the competing-risk regression with entire cohort, GRWR < 0.7 (aHR 2.03, 95% CI 1.06-3.87, p=0.033) were found to be independent risk factors for HCC recurrence, along with other factors such as AFP levels (aHR 1.15, 95% CI 1.08-1.23), PIVKA levels (aHR 1.12, 95% CI 1.02-1.22), pre-transplant locoregional treatment (aHR 1.76 95% CI 1.13-2.73), viable tumor number (aHR 1.04, 95% CI 1.02-1.06), maximum tumor size (aHR 1.20, 95% CI 1.14-1.26), and microvascular invasion (aHR 2.79, 95% CI 2.00-3.90).

Conclusion:

GRWR<0.7 can potentially lead to higher HCC recurrence in adult patients undergoing LDLT. Future high-quality research is encouraged to establish a clear relation between GRWR and HCC recurrence.