

A subclinical high tricuspid regurgitation pressure gradient independent of the mean pulmonary artery pressure is a risk factor for the survival after living donor liver transplantation

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Abstract

Background: Portopulmonary hypertension (POPH) is characterized by pulmonary vasoconstriction, while hepatopulmonary syndrome (HPS) is characterized by vasodilation. Definite POPH is a risk factor for the survival after orthotopic liver transplantation (OLT), as the congestive pressure affects the grafted liver, while subclinical pulmonary hypertension (PH) has been acknowledged as a non-risk factor for deceased donor OLT. Given that PH measurement requires cardiac catheterization, the tricuspid regurgitation pressure gradient (TRPG) measured by echocardiography is used to screen for PH and congestive pressure to the liver. We investigated the impact of a subclinical high TRPG on the survival of small grafted living donor liver transplantation (LDLT). **Methods:** We retrospectively analyzed 84 LDLT candidates. Patients exhibiting a TRPG ≥ 25 mmHg on echocardiography were categorized as potentially having liver congestion (subclinical high TRPG; n=34). The mean pulmonary artery pressure (mPAP) measured after general anesthesia with FIO₂0.6 (mPAP-FIO₂0.6) was also assessed. Patients exhibiting pO₂ < 80 mmHg and an alveolar-arterial oxygen gradient (AaDO₂) ≥ 15 mmHg were categorized as potentially having HPS (subclinical HPS; n=29). The clinical course after LDLT was investigated according to subclinical high TRPG. **Results:** A subclinical high TRPG (p=0.012) and older donor age (p=0.008) were correlated with a poor 40-month survival. Although a

higher mPAP-FIO₂0.6 was expected to correlate with a worse survival, a high mPAP-FIO₂0.6 with a low TRPG was associated with high frequency complicating subclinical HPS and a good survival, suggesting a reduction in the PH pressure via pulmonary shunt. **Conclusion:** In cirrhosis patients, mPAP-FIO₂0.6 may not accurately reflect the congestive pressure to the liver, as the pressure might escape via pulmonary shunt. A subclinical high TRPG is an important marker for predicting congestive pressure to a grafted small liver, resulting in a worse survival after LDLT.

Key words: hepatopulmonary syndrome, living donor related liver transplantation, portopulmonary hypertension, tricuspid regurgitation pressure gradient