Availability of a Web and Smartphone Application to Stratify the Risk of of Early Allograft Failure Requiring Liver Retransplantation

TO THE EDITOR:

We read with interest the study that associated increased hospital costs with early allograft dysfunction (EAD) after liver transplantation (LT).[1] We believe the dichotomic definition of EAD adopted[2] does not allow a granular stratification of both failure risk and costs. Indeed, Olthoff et al.[2] aimed to reexamine the previous EAD definitions by using clinical parameters correlated with injury pathways as endpoints in mechanistic studies. The Olthoff et al. study does not include a validation analysis nor was its goal used as a prognostic indicator for graft failure or clinical decision making. To overcome these limitations, the authors[1] used univariate analysis of several parameters.[3,4]

The early allograft failure (EAF) definition allows a quantification of the overall risk of failure at 90 days after LT. EAF would strengthen the analysis from Moosburner et al.[1]

We recently developed a multivariable score, Early Allograft Failure Simplified Estimation (EASE), to predict EAF and validated it in a large cohort[5] in order to (1) include donor and recipient factors associated with the outcome, (2) obtain the highest C statistic at 30 and 90 days, and (3) be easily implemented clinically.

The components of the EASE score are the following: laboratory Model for End-State Liver Disease score at transplant, number of packed red blood cell units, the presence of postoperative hepatic vessel thrombosis, and postoperative trends of aspartate aminotransferase, bilirubin, platelet count, and center

FIG. 1. The web EASE score calculator (www.transplanttools.com).

volume. The stratification of grafts into five classes allows characterization of the EAF, which includes EAD risk, and achieves a C statistic of 0.93 (95% confidence interval [CI], 0.89-0.97) and 0.87 (95% CI, 0.83-0.91) at 30 and 90 days, respectively.

To facilitate the EASE score, we developed a free web-based and smartphone application (Fig. 1). We agree with Moosburner et al. that the recipient's health status before LT remains a strong predictor of EAD and EAF. Donor factors and technical complications may also impact the graft injury. The EASE score facilitates the prediction and mitigation of the overall postoperative risk by disentangling EAD cases in a granular way and could be tested in the cohort[1] for assessing LT and retransplant costs. A tool for predicting EAF can lead to appropriate, early, and successful rescue retransplants and reduce hospital costs. An earlier retransplant will result in lower costs.

Alfonso W. Avolio, M.D. [iD][1,2]
Andrea Contegiacomo, M.D. [iD][3]
Salvatore Agnes, M.D. [iD][1,2]
Giuseppe Marrone, M.D., Ph.D. [iD][1]
Giovanni Moschetta, M.D.[1]
Luca Miele, M.D., Ph.D. [iD][1,2]
Marc L. Melcher, M.D., Ph.D. [iD][4]
[1]Dipartimento di Scienze Mediche e Chirurgiche, Fondazione Policlinico Gemelli Istituto di Ricovero e Cura a Carattere Scientifico (IRCCS), Rome, Italy
[2]Dipartimento di Medicina e Chirurgia traslazionale School of Medicine, Università Cattolica del Sacro Cuore, Rome, Italy
[3]Dipartimento di diagnostica per Immagini Radioterapia Oncologica ed Ematologia Fondazione Policlinico Gemelli IRCCS Università Cattolica del Sacro Cuore, Rome, Italy
[4]Division of Abdominal Transplantation Department of Surgery Stanford University, Stanford, CA, USA

REFERENCES

1) Moosburner S, Sauer IM, Förster F, Winklmann T, Gassner JMGV, Ritschl PV, et al. Early allograft dysfunction increases hospital associated costs after liver transplantation—a propensity score-matched analysis. Hepatol Commun 2020;5:526-537.
2) Olthoff KM, Kulik L, Samstein B, Kaminski M, Abecassis M, Emond J, et al. Validation of a current definition of early allograft dysfunction in liver transplant recipients and analysis of risk factors. Liver Transpl 2010;16:943-949.
3) González FX, Rimola A, Grande L, Antolin M, Garcia-Valdecasas JC, Fuster J, et al. Predictive factors of early postoperative graft function in human liver transplantation. Hepatology 1994;20:565-573.
4) Avolio AW, Agnes S, Chirico AS, Castagneto M. Primary dysfunction after liver transplantation: donor or recipient fault? Transplant Proc 1999;31:434-436.
5) Avolio AW, Franco A, Schlegel A, Lai Q, Meli S, Burra P, et al. Development and validation of a comprehensive model to estimate early allograft failure among patients requiring early liver retransplant. JAMA Surg 2020;155:e204095. Erratum in: JAMA Surg 2021;156:105.

View this article online at wileyonlinelibrary.com.

Potential conflict of interest: Nothing to report.