

Editorial

Pretransplant predictors of early mortality of liver transplantation

After nearly five decades of persistent exertion, liver transplantation (LT) has become a recognized and definite therapy with a highly successful outcome for various liver diseases, such as end-stage cirrhosis of the liver, acute liver failure, various metabolic diseases, and hepatic malignancy. The areas where major progress has been made, resulting in improvements in disease management, include refinements to surgical techniques, advances in critical care, and in particular, better immunosuppressive medication. Correspondingly, improved techniques for splitting the livers of deceased grafts and for carrying out live donor grafts have also played an important role over the past two decades in providing cures for many patients who have been waiting for LT from the deceased-donor waiting list.^{1,2} Many of these patients would have dropped off the list without these improvements. However, early mortality after LT still occurs even in the modern era. Identifying the predictors of early mortality after LT is an important issue that will allow the aggressive management of such potential events and help to minimize or even prevent these tragedies.^{3–6}

The causes of early or 30-day mortality after LT are varied and should be classified into three categories: donor factors, recipient factors, and operative factors (Table 1). The particular type of LT, either deceased donor or living related donor, also has some impact on early mortality. In terms of donor factors, poor-quality or so-called marginal grafts from deceased donors, grafts that are small in size, and partial grafts with a complicated anatomy from live donors seem to cause primary nonfunction or severe dysfunction of the implanted graft, which then leads to graft failure and patient death. ABO-incompatible grafts also show a higher rate of graft failure. In

terms of recipient factors, recipients in poor vascular condition—such as having a poor quality of hepatic artery, reverse portal flow with expanded portosystemic shunting, or a small or sclerotic portal vein—pose substantial challenges to surgeons. Some transplant centers will abandon LT as a treatment for these patients. In addition to the vascular condition of the recipient, the severity of the recipient’s illness prior to LT also influences the surgical outcome. Some patients are too ill to benefit from an LT. Under such circumstances, it is very difficult for surgeons and family to decide as to whether such a patient, who is extremely ill even under full medical support, should even have an LT. In terms of operative factors, massive intraoperative blood loss and technical failures, such as hepatic artery thrombosis, portal vein thrombosis, and hepatic vein thrombosis, are all well-documented prognostic factors with respect to early mortality.^{7,8}

If the severity of a recipient’s clinical illness is considered, the absolute contraindications with respect to LT for an aggressive transplant team are few—only brain death, severe hypoxemia under ventilation, and severe hypotension under vasopressors are absolute contraindications.⁹ Nevertheless, there are a number of relative contraindications indicating that the risk of LT early mortality is elevated when recipients have these conditions. However, under such circumstances, whether LT is completed or not is highly dependent on the attitude of the family, available hospital resources, and the LT policy of both the country and the transplant team itself. Ranking high on the list of relative contraindications are high-grade encephalopathy, septicemia with stable vital signs but not under appropriate medical control, poor cardiac function, severe hepatopulmonary syndrome, and severe pulmonary hypertension.¹⁰

Table 1
The preoperative and operative causes of early mortality after liver transplantation.

Donor factors	Recipient factors	Operative factors
1. Deceased or live donor	1. Severity of clinical condition, such as severe encephalopathy, poor kidney function, septic condition, poor lung or heart function	1. Successful or unsuccessful reconstructions of graft vessels
2. Cold and warm ischemic time		
3. Quality of graft: steatosis or fibrosis		
4. Age of donor		
5. Size of graft: small or large size	2. Vascular conditions: portal vein thrombosis, hepatic artery quality and small portal vein are all causes to early graft failure	2. Hemodynamic stability during operation
6. Vascular anatomy or biliary anatomy of graft		
7. Whole liver or partial liver		
8. ABO-compatible or not graft	3. High portal flow or portal pressure causes early graft dysfunction	3. Intraoperative blood loss

In the article by Youn et al,¹¹ the study analyzed the patients in order to identify pretransplant factors that predict early LT mortality. The authors divided their patients into two groups: a deceased donor group (DDLT) and a living donor group (LDLT). They concluded that severe hepatic encephalopathy (grade 3) in the DDLT and an abnormal serum creatinine level in the LDLT were the significant pretransplant variables related to early death after LT. In reality, the allocation system for deceased donor livers is largely dependent on the health status severity of the recipients, and therefore the mortality rate for the DDLT group was much higher than that for the LDLT group. A particularly high mortality rate was noted when fulminant hepatic failure was present, which is almost always associated with severe hepatic encephalopathy. When the LDLT patient characteristics were examined, the serum creatinine level of these patients was not particularly high (mean \pm SD, 1.0 ± 0.5). The appropriate cutoff value for the serum creatinine level and how such a value is decided were not well described in this article. Under such circumstances, practitioners should be very careful not to over-interpret the findings from this study.

Conflicts of interest

The author declares that there are no conflicts of interest related to the subject matter or materials discussed in this article.

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Chinsu Liu*

*Divisions of Pediatric Surgery and Transplantation Surgery,
Department of Surgery, Taipei Veterans General Hospital,
National Yang-Ming University School of Medicine,
Taipei, Taiwan, ROC*

*Dr. Chinsu Liu, Department of Surgery, Taipei Veterans General Hospital, 201, Section 2, Shih-Pai Road, Taipei, 112, Taiwan, ROC.

E-mail address: cslu@vghtpe.gov.tw