

The Nuts and Bolts of Simultaneous Liver-Kidney Versus Liver-Along Transplantation in 2023

By Yousuf Kyeso, Sambhavi Krishnamoorthy, and Beatrice P. Concepcion

Patients with liver failure are at an increased risk of developing acute kidney injury and chronic kidney disease (CKD) due to various factors. Some common causes of kidney dysfunction in patients with liver failure include hepatorenal syndrome, acute tubular necrosis, infection, bilirubin cast nephropathy, hemodynamic changes, and nephrotoxic medication use. The ultimate treatment for patients with liver failure is orthotopic liver transplantation (OLT), with or without simultaneous kidney transplantation.

The decision to pursue simultaneous liver-kidney transplantation (SLK) can be challenging. For patients in need of a liver transplant and with concomitant kidney dysfunction, the argument for pursuing SLK is that it confers a survival advantage compared with liver-alone transplant (1, 2). What becomes a challenge then is distinguishing between acute and reversible kidney dysfunction—in which case, SLK may be unnecessary—versus established CKD. Several points to consider in patients with liver failure and kidney dysfunction include the following:

- Serum creatinine-based estimated glomerular filtration rate (GFR) can often overestimate true kidney function due to the low muscle mass of patients with liver failure. Using cystatin C or a nuclear GFR scan may be helpful in obtaining a better estimate of kidney function, although these processes may not be readily available at all centers.
- The presence of proteinuria/albuminuria and radiologic findings, such as kidney echogenicity and small kidney size, point toward the presence of chronic disease; however, the absence of proteinuria/albuminuria and normal echogenicity and normal kidney size do not necessarily rule this out.
- A kidney biopsy may be helpful in identifying chronic pathologic changes, such as glomerulosclerosis, interstitial fibrosis, and tubular atrophy, but the procedure likely confers a higher-than-average risk of bleeding, as patients with liver failure may be coagulopathic.

The decision to pursue [simultaneous liver-kidney transplantation] in a patient with liver failure and kidney dysfunction is complex.

In 2017, the Organ Procurement and Transplantation Network (OPTN) implemented an SLK allocation policy requiring patients being listed for SLK to meet medical eligibility criteria (Figure 1) (2). Patients who do not meet criteria can still be prioritized to receive a “safety-net” deceased donor kidney transplant if their GFR is persistently ≤ 20 mL/min or if they are dialysis-dependent between 60 and 365 days after OLT. The implementation of the OPTN policy has not only allowed for a standardized approach to SLK listing but has also provided assurance to clinicians that a safety-net kidney transplant would be available in cases in which kidney dysfunction persists after OLT, hopefully limiting unnecessary SLK listing in patients with potentially reversible kidney dysfunction.

Indeed, preliminary data suggest that the OPTN SLK allocation policy has allowed for more efficient use of deceased donor kidneys while ensuring early access to kid-

ney transplantation among liver transplant recipients with CKD (3–5). Furthermore, a recently published study by Cheng et al. (6) found that among patients with liver failure who met SLK eligibility, only those with concomitant kidney failure derived a survival benefit after SLK, suggesting that more stringent criteria for SLK eligibility, along with more liberal safety-net priority criteria, should be considered.

In conclusion, the decision to pursue SLK in a patient with liver failure and kidney dysfunction is complex. A thoughtful and thorough assessment of the acuity and reversibility of kidney dysfunction is warranted while considering the medical eligibility requirements set forth by the OPTN. Decision-making should be approached in a multidisciplinary fashion in which transplant nephrologists, hepatologists, and transplant surgeons can weigh in to make the best decision for each individual patient. ■

Yousuf Kyeso, MD; Sambhavi Krishnamoorthy, MD; and Beatrice P. Concepcion, MD, MS, are with the Section of Nephrology, University of Chicago, IL.

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Figure 1. Eligibility criteria under the SLK Allocation Policy

