

Editorial

Transplantation of a Kidney with an Extra-Renal Organ

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Patients with end organ failure, be it hepatic, cardiac or pulmonary, all too often have concomitant renal dysfunction. Solid organ transplantation has become a relatively commonplace clinical undertaking, with outcomes that can be characterized as good to outstanding, depending on the donor and recipient characteristics involved. Over the past two decades in the United States, the number of deceased donor kidneys transplanted in combination with other organs from the same deceased donor has grown dramatically. The most common example, and the one for which the most data exist, is simultaneous liver and kidney transplantation (SLK). Since adoption of the Model for End-Stage Liver Disease (MELD) in 2002, the number of SLK transplants has increased more than six-fold [1].

The rapid and dramatic increase in SLK seems to have been driven primarily by the emphasis placed on serum creatinine in calculating MELD. In addition, the regulatory framework in the United States has been very permissive to SLK transplantation. Until August 2017, no Organ Procurement and Transplantation Network (OPTN) regulatory policies existed to provide medical guidance for the suitability of ESLD candidates for SLK versus LTA. The OPTN SLK policies enacted in 2017 were developed in an attempt decrease practice variation in SLK utilization across centers



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and provide guidance to clinicians making decisions on providing SLK versus LTA for candidates [2]. The intended and unintended impacts of those policy changes are still emerging.

It seems clear that increasing degrees of renal insufficiency prior to liver transplant are associated with worse post-LT outcomes [3]. It is also clear that post-LT renal failure confers a poor prognosis for the recipient. These factors, along with an apparent dramatic increase in the prevalence of acute and chronic renal insufficiency in candidates awaiting liver transplantation seem to be the primary clinical drivers of the increase in SLK numbers [4, 5]. The growth in annual numbers of SLK transplants has also occurred despite a relative paucity of data supporting a significant survival benefit for SLK versus liver transplant alone (LTA) in many subgroups of SLK recipients. There are more robust data supporting a survival benefit for SLK relative to LTA for those end stage liver disease (ESLD) candidates requiring renal replacement therapy (RRT) prior to liver transplantation [6]. The corollary to that is that net benefit may be minimal or absent in those undergoing SLK who do not have renal failure or on long-term RRT at the time of LT.

Finally, performance of transplants combining a deceased donor kidney with a lifesaving organ from the same donor seem to be on the cusp of a revolution made possible by the increased availability of cold pulsatile machine perfusion of kidneys and emerging advances in organ preservation. These current and near-term advances make it feasible to delay the kidney transplant until after stabilization of the recipient, and seems to offer hope for markedly improved outcomes and better organ stewardship.

With this in mind, we have commissioned this special issue of *OBM-Transplantation* to address the current state of SLK and other combined kidney transplants and their impact on transplantation. We have chosen to focus primarily on SLK because it is the source of exciting emerging data regarding patient selection, outcomes, and techniques, and because the volume of SLK transplants performed impact the supply of deceased donor kidneys for kidney transplant alone (KTA) candidates. This is an underappreciated and important issue, because every kidney transplanted in combination with another lifesaving organ is a kidney lost to the candidates with ESRD waiting for a KTA. This is especially impactful because the kidneys that are transplanted in combination with other organs tend to have low Kidney Donor Profile Index (KDPI) scores and thus would provide more net benefit to the KTA candidate pool than would lower quality (higher KDPI) kidneys [7]. It would seem prudent to evaluate the net cost of sending a high-quality kidney with an extra-renal organ by also including the substantial survival benefit that kidney would provide to a kidney alone recipient [8].

These are important topics for the present and future of transplantation, and we are please to present this special issue of *OBM-Transplantation*. We hope this issue will provide a forum for publication and an impetus to foster discussion of the role of combined kidney with other solid organ transplantation on the patients involved as well as the system-wide impact on the kidney alone candidates with ESRD waiting for life saving kidney transplant.

Author Contributions

Steven R. Potter was the sole author.

Competing Interests

The author has declared that no competing interests exist.

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