TECHNOLOGY
Kidney Viability Assessment System

OVERVIEW

Background:

Kidney transplantation is a lifesaving therapy for patients with end-stage renal disease. Currently, over 100,000 patients are annually waiting for kidney transplants, with organ shortages posing a major problem in kidney transplantation. While the vast majority of kidneys used for transplantation are obtained from heart-beating cadavers, many kidneys available for transplant are not utilized because of their unknown status (i.e., from non-heart-beating cadavers, long storage times, etc.). The biggest issue determining the status of donor kidneys is acute tubular necrosis (ATN) leading to varying degrees of delayed graft function (DGF) after transplantation. DGF, which is estimated to be 15-70%, represents a significant risk for eventual graft and patient survival and can be difficult to discern from rejection. Unfortunately, in present clinical practice, there is no reliable test to evaluate the viability of donor kidneys and determine whether or not donor kidneys might exhibit DGF. Therefore, there is a critical need for an objective and reliable way to predict post-transplant outcome in order to optimally utilize the donor kidney pool.

Innovation:

Researchers at the University of Maryland together with colleagues at the Georgetown Medical Center have developed a kidney viability assessment system. This system is a non-invasive optical technology based on optical coherence tomography, OCT, and augmented by an intelligent algorithm that can evaluate the status of donor kidneys in a real time. It includes a hand-held OCT imaging device and an automatic image-processing algorithm for quantification of kidney microstructures. The hand-held OCT device can globally survey the entire kidney surface within minutes and, together with the processing algorithm, automatically quantify the diameter and density of kidney microstructure and microvascular blood flows in real time. This foregoing information, previously unobtainable by convention means, will augment the transplant surgeon's capability to assess the donor kidney viability and better predict post-transplant donor kidney function.

APPLICATIONS

· Predict post-transplant donor kidney viability and post-transplant renal function.

ADVANTAGES

· Real-time analysis
· Global kidney analysis
· Anatomic and functional imaging

CONTACT INFO

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Additional Information

INSTITUTION

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EXTERNAL RESOURCES

- US Patent 9,737,256

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