A PIECE OF MY MIND

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The Perfect Match

Perfection is achieved, not when there is nothing more to add, but when there is nothing left to take away.

Antoine de Saint-Exupéry

The first successful kidney transplant was indeed a perfect match, performed in 1954 by Dr Joseph Murray at the Peter Bent Brigham Hospital between identical twins Richard and Ronald Herrick. The United Network for Organ Sharing (UNOS) and the Organ Procurement and Transplantation Network (OPTN) did not exist at that time; matching of the twin donor-recipient pair was confirmed when a small donor skin graft from Ronald was not rejected by Richard. And while the surgical principles of kidney transplantation have barely changed since that historic December day, the way in which we match recipients with their eventual donor has become very complicated.

I recently began my fellowship in kidney transplantation, and, as a surgeon, I initially focused on mastering the operation performed by Dr Murray. The allocation of the kidneys I would be transplanting would be handled by the OPTN; matching would be carried out in a sophisticated immunogenetics laboratory. I was grateful for the system presently in place, and, in my admitted naivete, I would not question it—alas, what individual person would want to make decisions about who receives and who does not?

I came to realize, however, that the process of bringing a donor and recipient together is one of the fantastically complex and genuinely interesting aspects of kidney transplantation. As with most rules, laws, and regulations, I will confess that the process of allocating organs can also be frustrating. So this transplant neophyte started to pay more attention to the current system through which deceased donor kidneys are allocated.

The current allocation system as administered by UNOS recently confronted me in a way I was not expecting.

A 78-year-old man with end-stage renal disease was brought in to the hospital as a kidney became available for him. He received a beautiful organ from an 18-year-old, the unfortunate victim of a head trauma. Technically, this organ is considered to be from a Standard Criteria Donor (SCD): basically from a young person, 50 years or younger, with virtually no medical problems. The recipient had spent nearly 7 years on dialysis after his kidneys failed, secondary to polycystic kidney disease. It is important to note that this patient made it through his operation uneventfully and has recovered without a hitch—many physicians and surgeons balk at the prospect of transplant surgery in near-octogenarians. This kidney could potentially function for more than 20 years, maybe 25 years, and though I do sincerely hope that our patient lives for 20 years, this is not likely—it’s not likely that a 78-year-old in an excellent state of health will live another 20 years. But how wonderful it will be for this gentleman to spend his next 10 or so years dialysis-free: traveling to his birthplace, pushing his grandchildren on the swing at the park, walking hand-in-hand with his wife.

At the most superficial level, the current allocation system, administered through UNOS, seems fairly equitable; a premium is placed on waiting time—the longer you’ve been on dialysis, the closer you will be to the “top of the list” within your blood type. Deceased donor kidneys are indeed a precious gift—a severely limited resource that is tied on one end to emotions of loss, the emotion of a new life on the other. More than 60,000 patients with end-stage renal disease are on the active waiting list, on standby for a telephone call from their transplant coordinator asking them to come to the hospital to receive a new kidney. UNOS has been working on an allocation system that seeks to improve matches based on the expected survival of both the recipient and the donor organ. Actual values known as the Kidney Donor Profile Index (KDPI) and Estimated Post-Transplant Survival (EPTS) have been proposed to maximize the dialysis-free years achieved through each and every kidney transplant. The KDPI essentially seeks to quantify the risk of allograft function and failure after transplantation, while the EPTS estimates the posttransplant survival of the actual recipient.

The proposed change in the kidney allocation rules would not provision for the patient above to receive this particular organ; the incorporation of KDPI and EPTS would allocate a high-quality, 18-year-old kidney to a recipient much closer in age, and with a far longer expected survival after the transplant. Was there a 25-year-old woman just behind this gentleman on the list? Wouldn’t it be perfect if she received a kidney from such a young donor? I’m not sure, of course, but that individual would be able to spend 20 to 25 years off of dialysis before she needed to seek another transplant. And so I found myself dealing with rather mixed feelings: happy for this gentleman, that he had achieved transplantation after waiting so long, but also a bit exasperated that our current system did not demand more in terms arriving at a match.

A brief Internet search reveals many organizations that believe that incorporation of the above changes is, in fact,
age discrimination. For the patient depicted above, an allograft from an Extended Criteria Donor (ECD)—say an ostensibly healthy 65-year-old who died suddenly of a ruptured cerebral aneurysm—would allow freedom from dialysis for at least the amount of time that he is reasonably expected to be alive. Many such ECD kidneys are actually discarded, I came to learn, because of fears that they may not function adequately, a true shame given the extraordinary need for them. Could the underutilization of ECD organs be a form of age discrimination on its own accord, I wonder? The purpose of implementing measures such as KDPI and EPTS is not to prevent older individuals, or sicker patients, from receiving a kidney transplant, but rather a way to facilitate better use of a profoundly limited resource.

Around the same time as the transplant described above, I was privileged to be part of a transplant that could not be dreamed by even the most creative mind—a perfect match if there ever was one. A 43-year-old developmentally delayed woman with two previous transplants, and antibodies in her blood to nearly 100% of the population, received a “zero HLA-antigen mismatch” kidney from the other side of the continent. While not a genetically identical organ—this only happens between monozygotic twins—it was about as close as it gets for two unrelated individuals and would help to minimize the chance of allograft rejection. The donor was a 40-year-old man, also developmentally delayed, who had died of a head injury; his organs were recovered, packed on ice, and sent west on a commercial jet. The transplant was technically challenging, a small place could be cleared for our anastomosis to the aorta and inferior vena cava, her abdomen replete with scar from her previous operations. We released the vascular clamps and the kidney instantly went from cadaveric gray to a robust, vivid pink; and despite this kidney’s transcontinental journey, it began to make urine right before our eyes in the operating room.

This patient had worked for many years in a skilled nursing facility despite the mammoth barriers of hemodialysis and her disability. She is now eager to go back to work, but not before a hard-earned trip to Disneyland. Our patient also told her transplant coordinator that this was a “perfect” match because her donor was also developmentally delayed. Her mother, now well into her 60s, can spend some more time with friends and taking care of herself in addition to enjoying time with her daughter. Where was the emotion-stirring background music we hear on television medical dramas? The changes in the UNOS policy would still allow for situations like this. One of my new mentors, a seasoned transplant nephrologist, put it best when he said, “There are some transplants so remarkable they simply take your breath away.” It did.

These two scenarios illustrate a phenomenon that we as physicians and other transplant professionals spend little time contemplating—our patients seek transplantation for different reasons. Our patients lose their kidney function at different stages in their lives, and for many different reasons. The changes proposed by UNOS to better allocate kidneys for transplantation will not result in many perfect matches, and this is not the objective. Because of these stories I came to realize that the current policy of getting in line and waiting your turn is undeniably outdated and will continue to suboptimally allocate donor kidneys. Measures and numbers such as KDPIs and EPTS might help us achieve better outcomes, but they cannot help us understand our patients’ stories. The new policy will, however, match recipients and donors in a more eloquent fashion and hopefully lead to better outcomes all around.

As for “perfect” matches in transplantation, however, we all have to watch for them, because they do appear—like comets and shooting stars. Perfection just simply does not follow rules or algorithms, and always occurs just slightly outside the proverbial box.

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