Transplantation: Living Kidney Donation

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PKD Foundation
Conflicts of Interest

Abbott
Kadmon – PKD
Otsuka – PKD
Pfizer – PKD
“Renal Replacement Therapies”

- When kidneys fail, we now have the ability to support patients via artificial means indefinitely

- Hemodialysis

- Peritoneal Dialysis

- Transplantation (since 1954)
Dialysis vs Transplant

Patient Survival Rates by Dialysis and Transplant

Source: Based on UNOS data
Waiting List


Source: Based on UNOS data
Source of Kidneys

Source: Based on OPTN data

Washington University: approximately 230 kidney transplants per year

Source: Based on OPTN data
Living vs Deceased

The Transplant Team

- Transplant Surgeons
- Transplant Nephrologists
- Living Donor Nephrologist
- Nurse Coordinators
- Social Workers
- Pharmacists
- Dieticians
- . . . And Many More
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How To Be a Donor

• Early in the transplant work-up, potential living donors can be identified by the recipient
• Usually begins with blood-relatives, but extends to spouse, in-laws, friends, etc.
How To Be a Donor

• The potential donor must be in relatively good health and, as with the recipient, there is no age cutoff.

• The potential donor should not have:
  – Kidney Disease
  – Diabetes
  – Hypertension
  – Cancer
How To Be a Donor

• Closeness of match is still relevant
• Blood type
  – A, O, B, AB
• Human Leukocyte Antigen matching
  – Six HLA positions evaluated
  – 2 copies of each, on chromosome 6
  – Parent/Child will match at least 3 of 6
  – Siblings
    • 25% will match 6 out of 6
    • 50% will match 3 out of 6
    • 25% will match 0 out of 6
How To Be a Donor
How NOT To Be a Donor

• Paid donation is NOT permitted.

• The insurance of the recipient generally covers the costs of donation.

• However, if abnormalities are found during the workup, the potential donor may be referred back to the primary physician and the costs of additional tests may not be covered.
The Work-Up

• 1) Kidney Function
• 2) Blood Pressure Screening
• 3) Diabetes Screening
• 4) Infection Screening
• 5) Cancer Screening
The Work-Up

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Kidney Function

- The first screening test is the test we should all already be familiar with: CREATINININE

- From this number, we can CALCULATE an estimated GFR from two equations
  - MDRD
  - CKD-EPI
Kidney Function

• But these equations are still only estimates... we need to be more certain

• We can MEASURE kidney function by one of two methods
  – 24-hour urine for creatinine clearance
  – Iothalamate (nuclear med) for GFR
The Work-Up

• 1) Kidney Function
• 2) Blood Pressure Screening
• 3) Diabetes Screening
• 4) Infection Screening
• 5) Cancer Screening
Blood Pressure Screening

- Hypertension is common and can lead to kidney injury over years to decades
- The donor needs to have a BP <140/90. . . however, for a donor in their 50s or older, WELL-CONTROLLED blood pressure on a single agent may not disqualify from donation
Blood Pressure Screening

- We request three outside readings, and measure once at the office visit

- If there is a concern, we would recommend a 24-hour blood pressure monitor
The Work-Up

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• 2) Blood Pressure Screening
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Diabetes Screening

• Diabetes mellitus is the most common reason for patients to progress to dialysis or transplant

• Screening is with:
  – Fasting blood glucose (<100)
  – Hemoglobin A1c (<6.0%)
  – Urinalysis for microscopic protein

  – If still a concern: 2-hour glucose tolerance test
The Work-Up

- 1) Kidney Function
- 2) Blood Pressure Screening
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- 5) Cancer Screening
Infection Screening

• HIV
• Hepatitis B (sAg, sAb, cAb)
• Hepatitis C
• Syphilis (RPR)
• Cytomegalovirus (CMV)
• Epstein-Barr virus (EBV)

• If travel history, may require more testing
The Work-Up

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Cancer Screening

• “Age-appropriate” cancer screening
  – Chest X-ray
  – CT scan of abdomen and pelvis
  – Colonoscopy (50+)

• For women:
  – Pap smear
  – Mammogram (40+)

• For men:
  – PSA (50+)
CT Scan

• The CT scan is more than just for cancer screening
  – Presence of TWO kidneys
  – Kidney size discrepancy
    • May require split function study
  – Evaluate for kidney stones
    • May require urine stone battery
  – Road map for surgeons
Surgical Approach

Mini-Nephrectomy

Laparoscopic Nephrectomy
Surgical Recovery

DONOR: ~3 days
RECIPIENT: ~4 days
Surgical Recovery

- Recovery time at home: 4-6 weeks
- The creatinine typically rises after donation (generally to ~1.5), the plateau after six month
- The creatinine then typically **DECREASES** over the next 1-2 years, **towards** the pre-donation level
Surgical Recovery

- Complications rates are low given the overall health of the donor
- However, serious complications have been reported to occur
  - Donor death: 3 per 10,000
  - Donor requiring transplant: 4-10 per 10,000
- We encourage early ambulation after donation to minimize risk of clots
- Cessation of hormonal therapies 6 weeks prior to procedure
Long-Term Outcomes

- On average, kidney donors have a life-expectancy that is **INCREASED**!
  - A series of 400 former donors found no accelerated loss of kidney function
  - There was no increased prevalence of hypertension (same as general population)
  - No increase in obstetrical risk from general population, although recommended to delay pregnancy for at least two months