

Retransplant Considerations in the Patient with a Failing Allograft

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Disclosures

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Objectives

- Cases-retransplant evaluation
- Epidemiology of transplant failure
- Outcomes after retransplantation
- Preemptive transplant vs dialysis first
- Immunosuppression after the graft fails
- Graft Nephrectomy-is it necessary?
- Immunosuppression after retransplant
- BK infection, HIV and retransplant
- Recurrence and cancer risk

Cases

- 36 yo female-s/p transplant from her mother in 2000-was found to have RCC on her left native kidney
- 72 yo male-s/p DD transplant in 2007-h/o cryptococcal meningoencephalitis, mild coronary artery disease, and on warfarin for pulmonary emboli
- 33 yo male-s/p kidney transplant from his wife in 4/2016, stopped taking his meds; treated for AMR-now on dialysis
- 34 yo female-s/p OMM transplant from her sister in 2011-recurrent FSGS, now near dialysis
- 36 yo female-s/p DD transplant in 2001 for FSGS-has advanced CKD-diagnosed with breast cancer in 12/2016

Waiting List-on 12/31/2015

Figure 6.1

Number of patients who were wait-listed for kidney transplant, 1998-2015

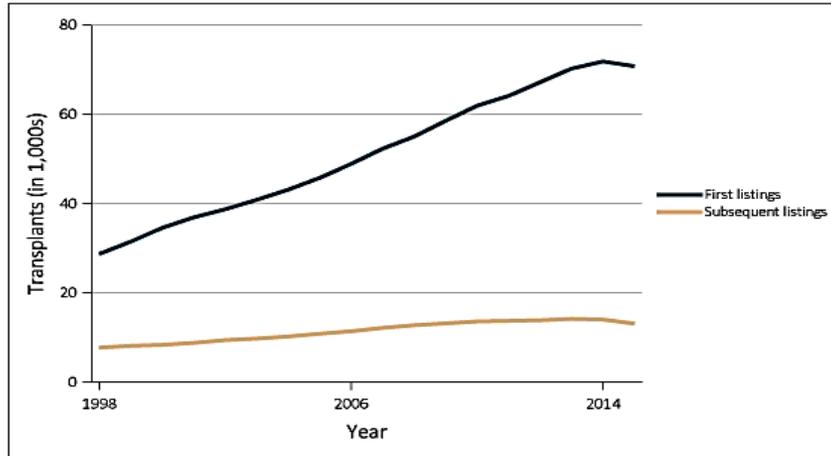
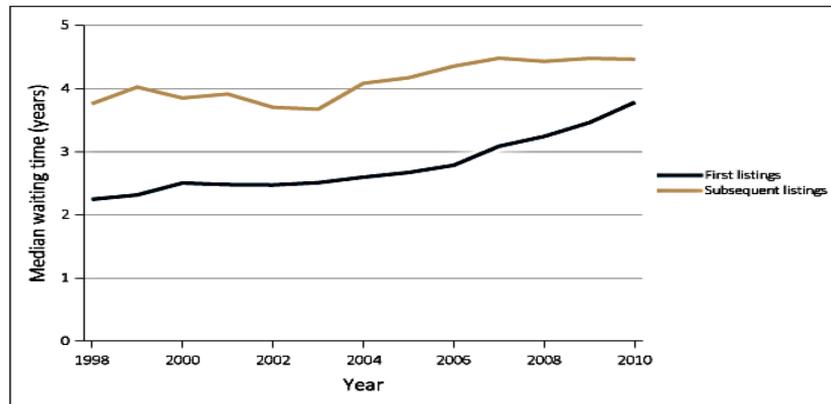


Figure 6.4

Median waiting time for kidney transplant, 1998-2010



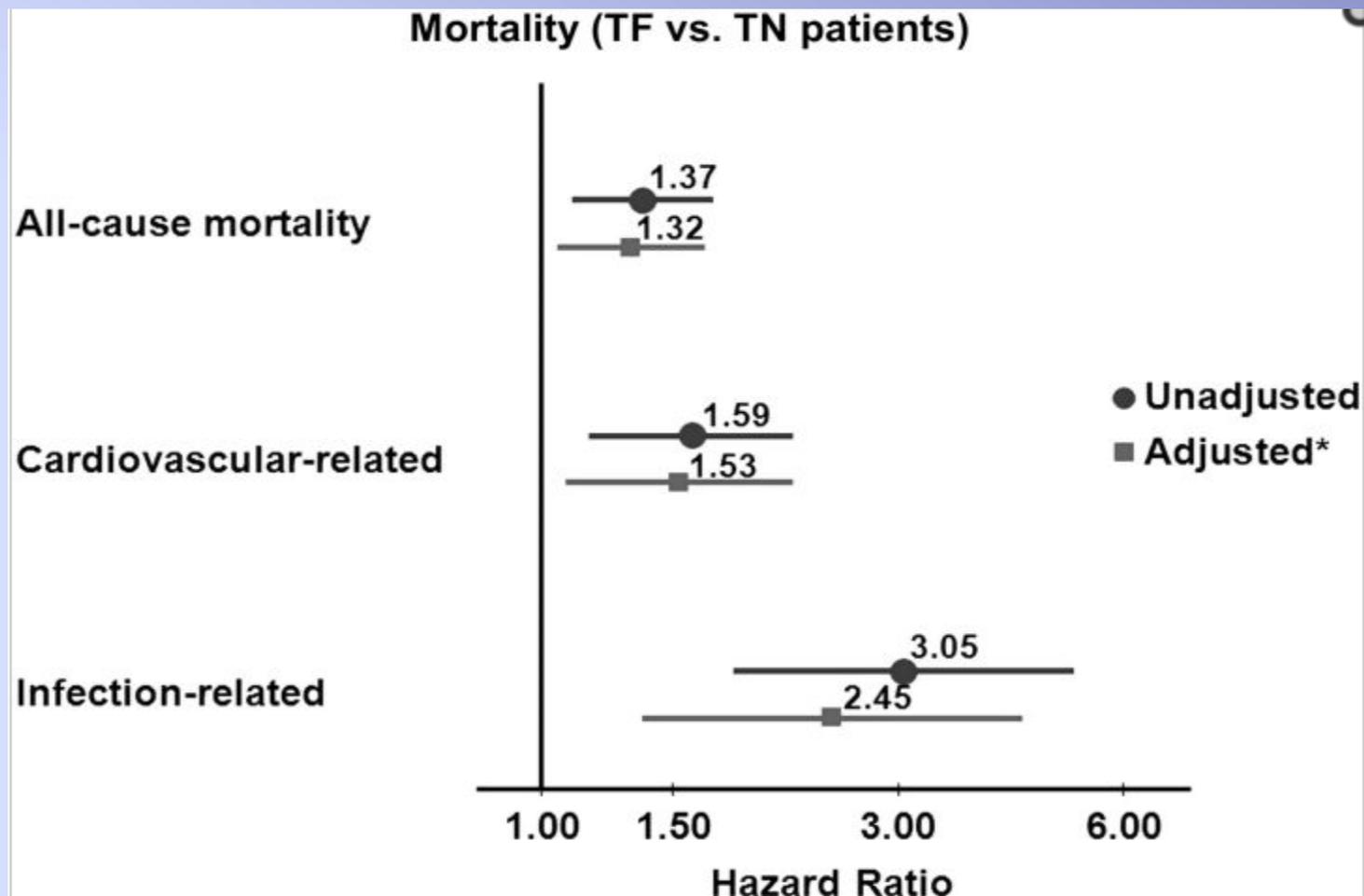
- Continues to grow (83,978 candidates on dialysis)
- 84% awaiting their first transplant and **16% awaiting re-transplant**
- **Prior transplants wait longer**

Return to Dialysis

- Number of patients returning to dialysis after graft failure about 5000 annually, or 4-5% of the incident dialysis population
- Over 90% of patients with failed graft will return to dialysis; approximately 10% will undergo preemptive repeat transplantation
- In 2015: **13.2% of kidney transplant recipients had prior allograft failure**

Gill JS, et al. Kidney Int 2002, Ansell D, et al. Am J Transplant 2007

Pham PT, et al. World J Nephrol 2015; Hart A, et al. Am J Transplant 2017



- Data from the Dialysis Outcomes and Practice Patterns Study (DOPPS) between 1996-2008
- **All-cause mortality is 32% higher** for transplant failure (TF) patients on dialysis than for transplant-naïve (TN) patients, with **a hazard ratio for death from infection-2.45**

Perl J, et al. Nephrol Dial Transplant 2012

Recipients with Failed Kidney Graft

- Likely to be more sensitized
- More comorbidities-diabetes and cancers
- Lower graft survival rate compared to primary transplants-old data
- Significant life expectancy benefit compared to patients on dialysis
 - Retransplantation associated with a covariate-adjusted **50% reduction in mortality**, relative to remaining on dialysis, most pronounced in the 18- to 59-year age group-Canadian patients (*Rao P, et al. Transplantation 2006*)

Outcomes-Retransplantation

- UNOS database; all adult patients transplanted between 1/2000 and 12/2014
- Primary kidney transplants (n=178,947), mean age at transplantation 50.9)
- Patients with retransplants (n=17,819, mean age at transplantation 44.7)
- **Higher DGF** (20%) and **higher PRA** in retransplants (54% vs 13%)

	N		Median survival time	95% confidence interval of median survival time	1-year survival rate	5-year survival rate	10-year survival rate
Primary Kidney	178,947	Graft Survival	10.7	10.6-10.8	93%	76%	53%
		Patient Survival	12.2	12.1-12.3	96%	84%	61%
Repeat Kidney	17,819	Graft Survival	10.5	10.2-10.7	92%	74%	51%
		Patient Survival	13.2	12.9-13.5	97%	86%	67%

• **Kidney allograft outcomes and patient survival were comparable** in primary and repeat kidney transplant recipients

El-Husseini A, et al. Clin Transplant 2017

Retransplants vs Primary Transplants: A Mate Kidney Paired Analysis

- Comparing outcomes (GS and PS) between first time transplants and retransplants from same deceased donor-analysis of mate kidneys from the same donor
- UNOS/OPTN database; 2000-2010
- Cohort of 6,266 common-donor pairs; recipients of a second transplant (91.6%) and recipients of third or more transplants (8.4%)

Retransplants vs Primary Transplants: A Mate Kidney Paired Analysis

- **Retransplants**: younger; higher proportion of PRA>80; more pre-emptive transplant, more DGF and more rejection
- **Similar patient survival; worse graft survival**, especially among the **recipients of third or more transplants**; more graft loss due to recurrence

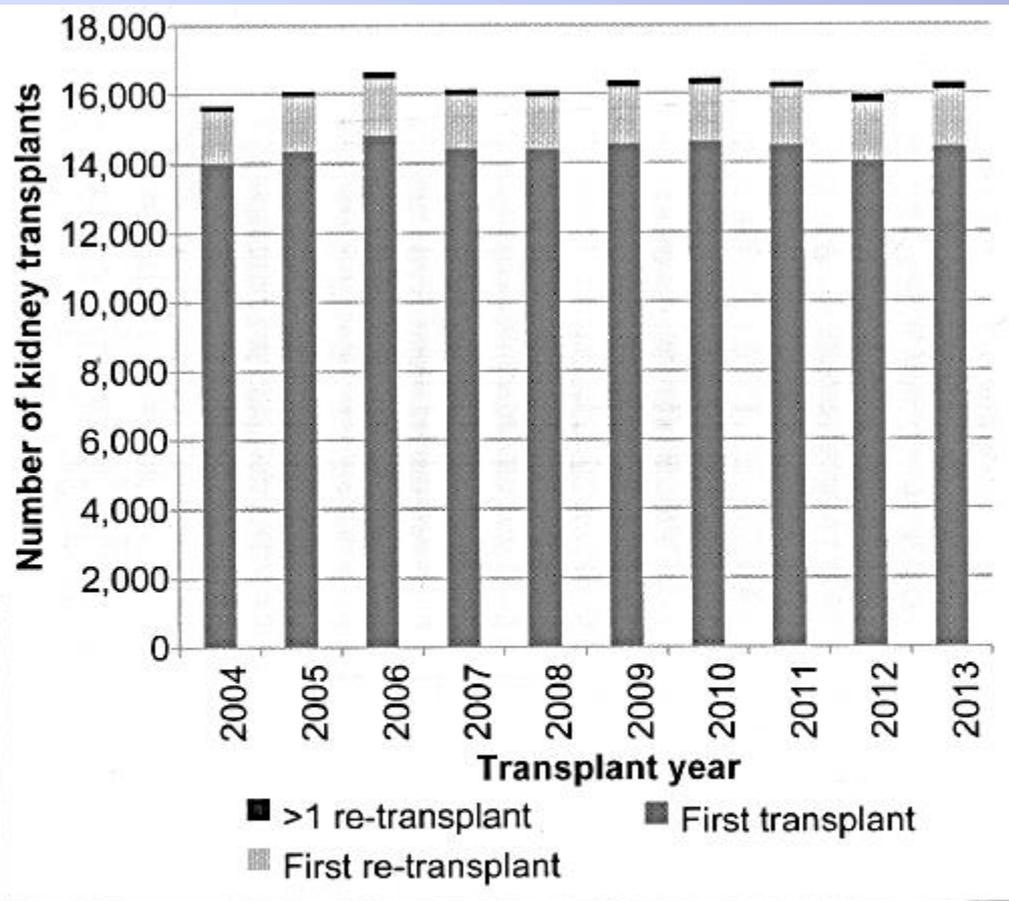
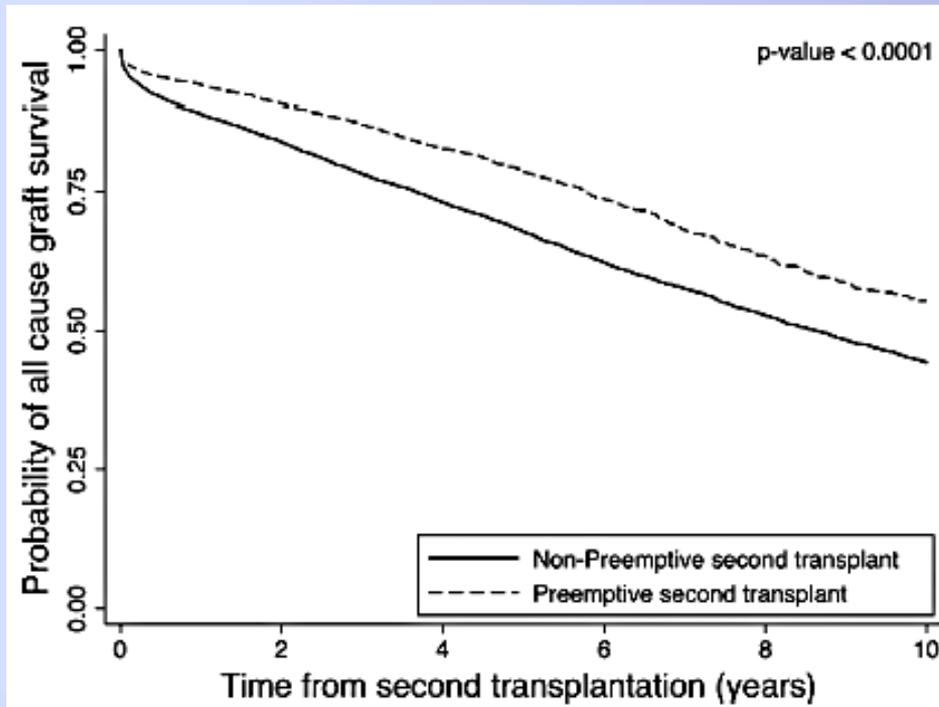


Figure 3. Annual kidney re-transplants, 2004-2013.

- **Slight increase** in numbers for re-transplants and multiple re-transplants
- **Similar** graft survival for the first and second re-transplants
- Significantly **lower graft survival** for patients who received **>2 kidney** transplants

• UNOS/OPTN database

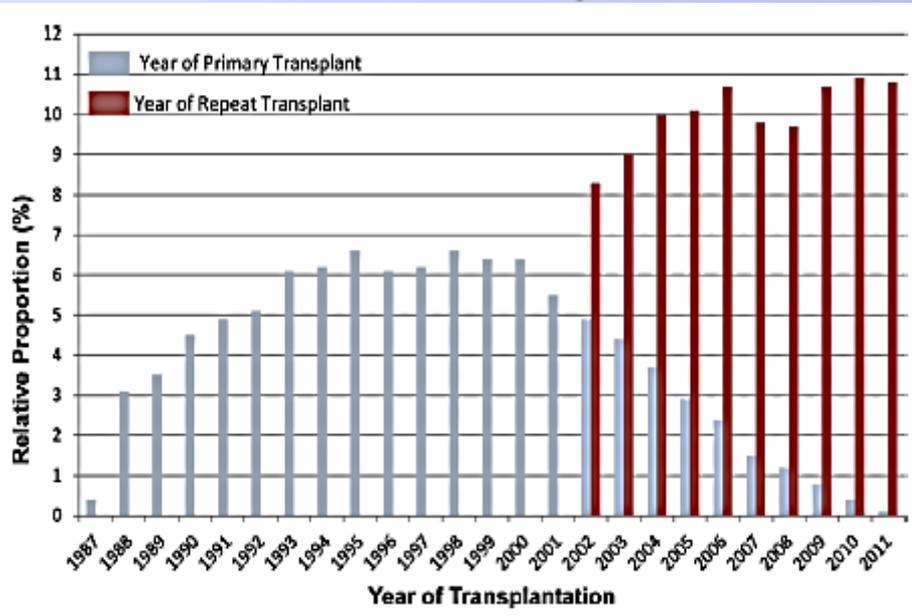
Outcomes-Retransplantation



- USRDS data
- 3509 **preemptive** and 14,075 **nonpreemptive** second kidney transplants between 1995 and 2007

- Preemptive: **less AR** (12% vs 16%); **less DGF** (8% vs 23%); **more living donor**
- Preemptive: **lower risk of graft failure** from any cause including death; decreased death with a functioning graft
- 34% increased risk of death-censored graft loss in preemptive recipients when 1st tx survival <1 year

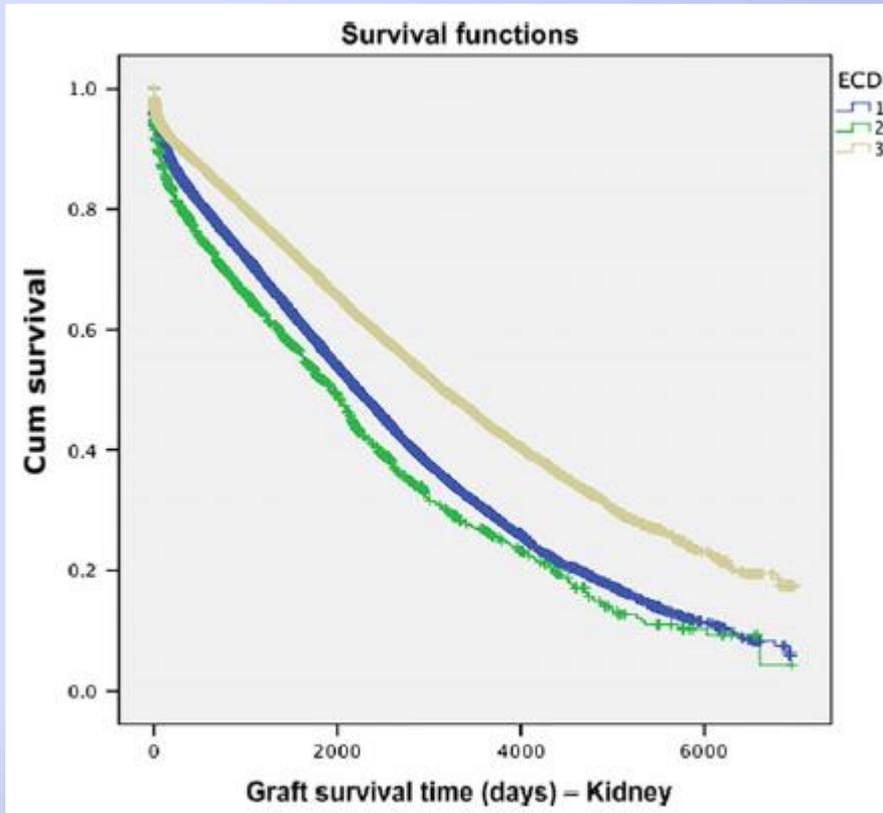
Outcomes-Retransplantation (Similar Outcomes)



- 11,698 adult kidney 2nd retransplant recipients (SRTR data), 2002-2011
- Patients who had **AR on 1st transplant were more likely to have AR on their retransplant (26% more)**

•Other factors for AR within 1 year after retransplantation: shorter GS from 1st transplant, older donors, younger recipients, PRA>30%, BMI>35, having A,B or DR HLA mismatches in the retransplant and dialysis vintage

Donor Selection



- In regions with long waiting times, patients might benefit from re-ECD transplants

- Transplants 1994-2013; 42.4% retransplants
- **Re-ECD** kidneys had higher risk of DGF, graft failure and had worse PS than re-SCD
- Re-ECD had a **higher mortality** risk

Panchal H, et al. Transpl Int 2015

Immunosuppression-What to Do When Graft Fails?

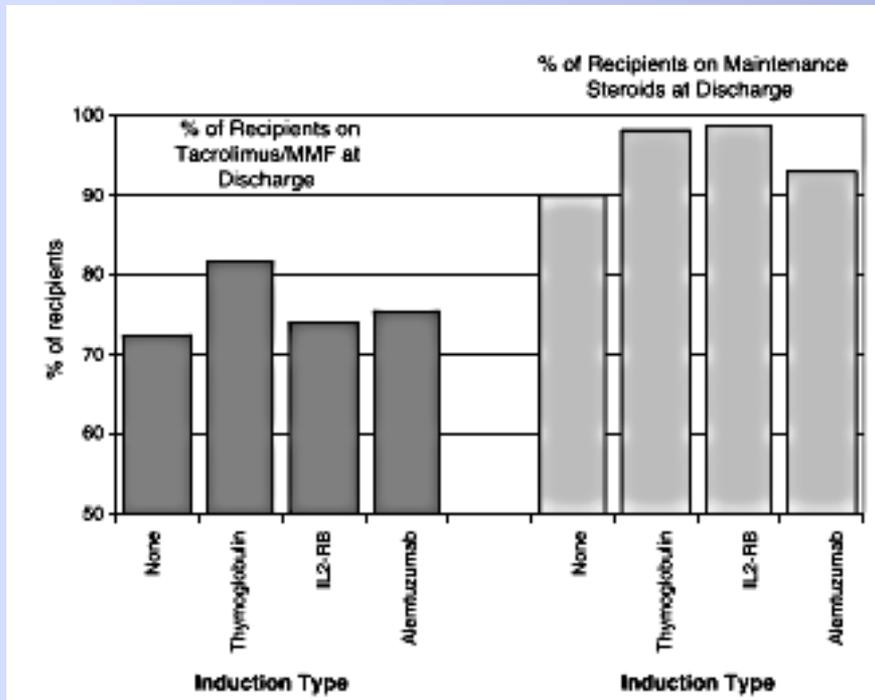
- No consensus; lack of data
- Might continue some meds-low dose CNI and/or steroids if there is a plan to re-transplant relatively soon after graft failure
- **Taper and stop immunosuppression** entirely over some period of time (up to 6 months) if there is **no plan to re-transplant** or in the event of serious infection/cancer

British Transplantation Society Guidelines

- Immunosuppressive therapy **be continued to avoid immunologic sensitization if a living kidney donor is available** and there is the prospect of **retransplantation preemptively or within 1 year of starting dialysis**. (2C)
- Immunosuppressive treatment be withdrawn after graft failure when there are immunosuppression-related complications such **as skin cancer and an anticipated delay in retransplantation**. (2C)

Induction Immunosuppression- Retransplantation

- SRTR database
- 14,336 adult (age ≥ 18 years) recipients of retransplants between 2003 and 2011-18% no induction, 57% thymoglobulin, 16% IL-2 receptor blocker, and 10% alemtuzumab
- Patients with IL-2 receptor blocker induction less likely to be highly-sensitized or African American
- Increase in use of Thymoglobulin induction over the years



- DGF-23% in DD transplants-no differences between groups
- No differences in 1-year BK virus or patient death

• Patients treated for **acute rejection** within 1 year: **9.0%**-no differences between groups (more early rejection in patients without induction)

Unadjusted outcomes by induction treatment

Clinical outcome ^a	Induction treatment				P
	None (n = 2514)	Thymoglobulin (n = 8118)	IL-2 RB (n = 2225)	Alemtuzumab (n = 1479)	
Delayed graft function ^b	22.5%	23.6%	21.3%	27.2%	0.04
Early acute rejection ^c	4.8%	2.7%	4.6%	1.3%	<0.001
One-year acute rejection ^d	8.8%	9.1%	8.3%	10.4%	0.45
One-year serum creatinine, mg/dL ^d	1.43	1.46	1.43	1.46	0.05
One-year malignancy ^d	1.0%	1.3%	1.8%	1.6%	0.17
One-year treatment for BK virus ^d	3.8%	3.9%	3.2%	4.0%	0.64
One-year hospitalization ^d	36.9%	42.2%	39.2%	35.9%	<0.001
One-year overall graft survival	93.4%	94.2%	95.3%	92.8%	<0.001 ^e
Five-year overall graft survival	75.8%	76.4%	78.9%	74.0%	
One-year patient survival	96.8%	97.3%	97.5%	97.0%	0.72 ^e
Five-year patient survival	87.5%	88.1%	86.9%	86.0%	

^a Results weighted by inverse probability of treatment with no induction.

^b For deceased donor transplants only.

^c Defined as the time between transplantation and hospital discharge.

^d Minimum 1-year graft survival.

^e Based on log-rank test.

- Recipients with **alemtuzumab** had the **highest** relative risk for **graft loss**

- “No induction” group had the highest average 1-year estimated GFR (62 mL/min/1.73kg/m²) and lowest incidence of any malignancies within 1 year (1.0%)

- Similar patient survival rates

Schold J, et al. Transplantation 2015

Transplant Nephrectomy-Survival

- 10,951 transplant recipients who returned to dialysis between 1/1994 and 12/2004 (US Renal Data System); 3,451 (31.5%) had allograft nephrectomy during follow-up
- Transplant nephrectomy was associated with a 32% lower adjusted relative risk for all-cause mortality

Ayus JS, et al. JASN 2010

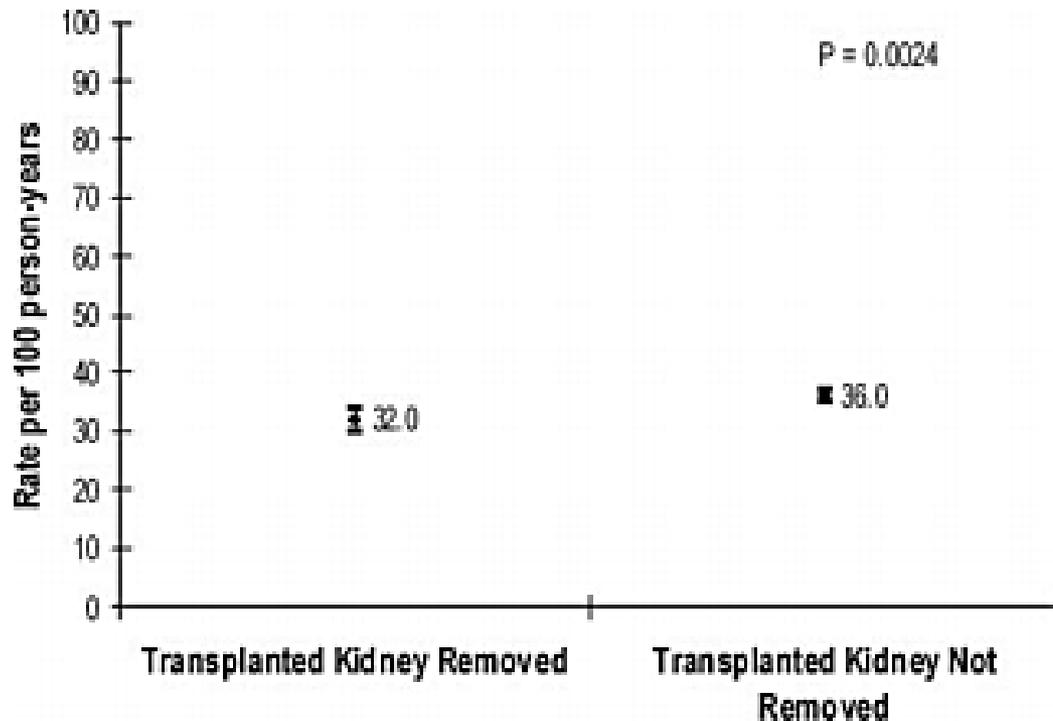


Figure 2. Unadjusted rate of death from any cause associated with or without receipt of renal allograft nephrectomy in 10,951 patients returning to maintenance dialysis after a failed kidney transplant between January 1, 1994, and December 31, 2004, is shown.

- Large observational study
- Cause of nephrectomy or symptoms-not known
- Significant differences in comorbidities
- No info on concomitant therapies or histology
- No longitudinal comorbidity data

Transplant Nephrectomy

- Reported ranging from 5% to 35%; **more likely to be performed** in patients who had graft failure **within 12 months** posttransplant
- Morbidity: 10-68%; Mortality: 1.2-38%
- Complications: blood loss/need for transfusion, wound infections, surgical complications (especially late in the course)

O'Sullivan DC, et al. J of Urol 1994

Zargar MA, et al. Transplant Proc 2001

Mazzucchi E, et al. J of Urol 2003

Johnston O, et al. AJT 2007

Results-Late TN

- 47 patients (89%): had acute rejection-**grade 2B (21%) and grade 3 (43%)**
- 32 patients (60%): had interstitial hemorrhage
- 4 patients had TN to create “space” for the new transplant; all had grade 3 IF/TA; one 2B AR; one grade 3 AR and one grade 1A AR, **suggesting ongoing inflammation despite not being clinically symptomatic**
- **7 patients (32%) did not have DSAs pre-TN but developed DSAs post-TN**

Maintaining Immunosuppression Does Not Reduce Sensitization

- 33 patients with early graft loss/rapid nephrectomy (within first week)
- 11 patients continued immunosuppression for 3 more months after the nephrectomy
- At 1 year post-TN, anti-class I, II, and I+II DSAs were present, respectively, in 5 (45%), 2 (18%), and 2 (18%) patients who had continued immunosuppressive treatment and in 4 (19%), 2 (9%), and 8 (38%) of the controls
- **More infections noted**

Recommendations-Late TN

- Grafts in patients with symptoms should be removed quickly
- There is **no clear evidence** that routine nephrectomy in clinically asymptomatic patients is beneficial; though these patients might have undiagnosed chronic inflammation

Transplant Nephrectomy and Retransplant

- Patients having primary transplant nephrectomy with worse second allograft outcome-especially antilymphocyte globulin was not used
- In the cyclosporine era, nephrectomy had no significant influence on retransplantation
- Higher PRA but no significant differences in graft outcomes in retransplants
- Patients with failed graft nephrectomy tended to have a higher risk of primary nonfunction and acute rejection after retransplantation

Abouljoud MS, et al. Transplantation 1995

Douzdjian V, et al. Clin Transplant 1996

Lair D, et al. Kidney Int 2005

Schleicher C, et al. Transpl Int 2011

Transplant Nephrectomy and Retransplant

- Meta-analysis: 20 studies in 13 articles; 1802 patients, of which 919 (51.0%) underwent TN, 883 (49.0%) had not undergone TN
- The No-TN group had a significantly higher 3-year graft survival rate and 5-year graft survival rate than the TN group
- The rates of 5-year patient survival, positive panel reactive antibody, AR and delayed graft dysfunction were all significantly higher in the TN group

Transplant Nephrectomy and Retransplant

- Compared with the No-TN group, cold ischemia time was longer in the TN group
- The rate of 1-year and 10-year graft survival, serum creatinine levels at 1 year after retransplantation and the time of hemodialysis before recent transplantation were similar between the TN and No-TN groups
- Summary: allow the failed graft to remain, unless symptoms dictate the need for surgery; removal of the primary graft kidney increased the risk for recipient sensitization; leaving the primary asymptomatic renal graft in situ has a favorable effect on the outcomes of retransplantation

Repeat Transplantation after Graft Loss from BK nephropathy

- 31 patients with graft loss due to BK nephropathy-6 Centers
- Transplant at a median of 6 months after failure (10/31 preemptively)
- 26 patients had BK viremia clearance (median time from clearance to retransplant-14 months)
- 13 patients had a transplant nephrectomy before retransplantation (23% had BK virus replication; one developed BK nephropathy)

TABLE 1. Baseline characteristics of kidney retransplant recipients with previous loss of renal allograft to BKVN

Patient number	31
Age at transplant (yr), mean \pm SD	47.0 \pm 16.5
Gender (M:F)	20:11
Donor source, n (%)	
LRD	6 (19)
LURD	8 (26)
DD	17 (55)
Preemptive transplant, n (%)	10 (32)
Documented viral clearance, n (%)	26 (84)
Allograft nephrectomy before retransplant	13 (42)
Time from allograft loss to retransplant (mo), median (range) ^a	15 (0.7–116)
Time between viremia clearance and retransplant (mo), ^b median (range)	14 (1–112)

^a In 21 patients not preemptively transplanted.

^b In 26 patients with documented viremia clearance.

Induction immunosuppression, n (%)

None	5 (16)
Anti-CD20 monoclonal antibody	1 (3)
IL2 receptor antagonist	15 (48)
Antithymocyte globulin	8 (26)
Anti-CD52 (alemtuzumab)	2 (6)

- Follow-up: median of 30 months (range, 4-161 months)
- 7 patients had 10 episodes of acute rejection
- 11 patients had BKV replication after repeat transplantation-
viruria (n=5) and viremia (n=6)
- 20/26 with viral clearance did not experience BKV replication
in the repeat transplant; **viremia clearance was associated
with absence of BKV replication after retransplantation
(p=0.003)**

Retransplantation-BK

- OPTN/UNOS database; graft loss between 2004 and 2008; subsequent retransplantation
- 823 graft losses; 126 repeat kidney transplant as of June 5, 2009 (at a median of 314 days after graft failure)
- As of June 5, 2009, 118/126 grafts were still functioning, one graft failure attributed to BK; treatment for BK was reported in 17.5% of the retransplants
- 1-year and 3-year Kaplan–Meier graft survival rates were 98.5% and 93.6%

Retransplantation (re-KT) in HIV+ Recipients

- SRTR data (2004-2013); 22 HIV+ vs. 4127 HIV-negative adult re-KT
- HIV+ re-KT recipients: more commonly AA (63.6% vs. 26.7%, $p < 0.001$), infected with hepatitis C (31.8% vs. 5.0%, $p < 0.001$) and had longer median time on dialysis (4.8 years vs. 2.1 years, $p = 0.02$)
- HIV+ re-KT recipients: had 3.11-fold increased risk of death and 1.96-fold increased risk of graft loss compared to HIV- re-KT recipients

Surgical Issues

- Retransplant in the ipsilateral iliac fossa could be surgically challenging-more scar tissue, more blood loss, longer operative time, more vascular complications and graft loss within the first year posttransplant
- If possible to proceed with contralateral location to the prior failed one

Risks of Cancer in Retransplants

- Data from the Transplant Cancer Match Study-links SRTR with 15 cancer registries
- 109,224 primary transplants and 6,621 retransplants (6,309 second, 296 third, 16 fourth transplants)
- Retransplants: younger (median age 40 vs 46 yrs), had higher PRA, and more often received induction with polyclonal antibodies (43% vs 25%)

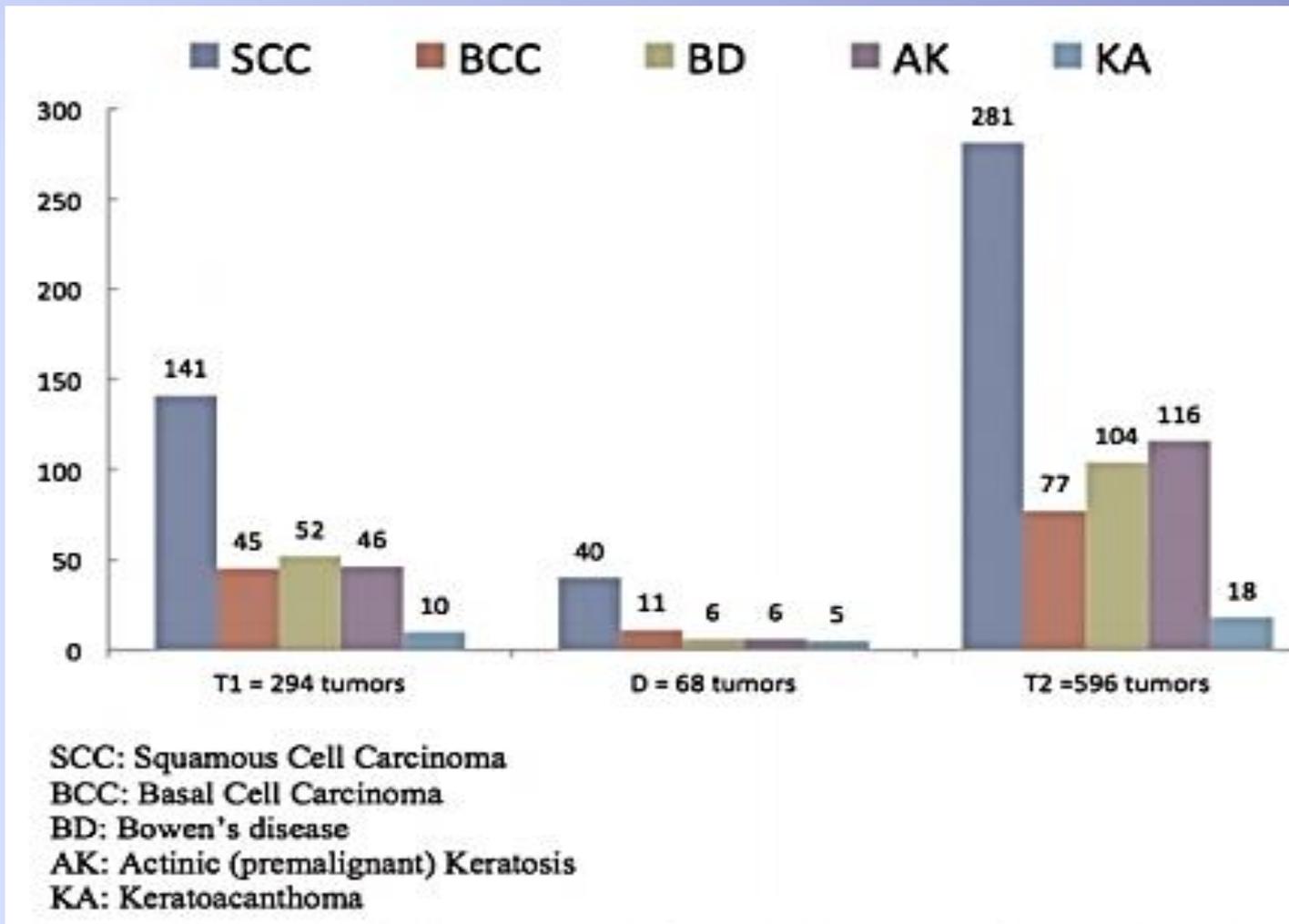
Age-adjusted associations comparing cancer risk in primary kidney transplant and kidney retransplant recipients

Organ system	Primary transplant		Retransplant		Incidence Rate Ratio	Lower 95% CI	Upper 95% CI
	Cases	Incidence Rate	Cases	Incidence Rate			
Lip, Oral Cavity, Pharynx	225	44.4	13	52.7	1.35	0.77	2.37
Gastrointestinal Tract	565	112	15	60.8	0.72	0.43	1.20
Liver, Biliary Tract, and Pancreas	179	35.4	5	20.3	0.77	0.32	1.88
Lung	634	125	20	81.0	0.93	0.59	1.45
Bone and Soft Tissues	44	8.7	3	12.2	1.65	0.51	5.32
Melanoma and Other Skin	387	76.5	19	77.0	1.26	0.79	2.00
Breast	338	66.8	9	36.4	0.64	0.33	1.24
Female Reproductive	172	82.6	9	83.4	1.05	0.54	2.06
Male Reproductive	681	229	21	151	0.90	0.58	1.39
Kidney, Renal Pelvis, and Bladder	788	156	56	227	1.74	1.33	2.29
Thyroid	175	34.6	8	32.4	1.01	0.50	2.06
Lymphoid Neoplasms	869	172	32	130	0.77	0.54	1.09
Leukemias	69	13.6	7	28.4	2.30	1.05	5.02
Miscellaneous	631	125	28	113	1.14	0.78	1.67
All cancers	5,757	1137	245	992	1.06	0.93	1.20

- Overall cancer risk not different in retransplants compared to primary tx
- Retransplantation: associated with **higher risk of cancers of the kidney (RCCs), renal pelvis, and bladder; also a higher risk for leukemias**
- Would it be beneficial to screen for RCC in retransplants?

Skin Cancers after Kidney Retransplantation

- Multicenter study; 53 patients with history of cutaneous SCC after 1st kidney transplant; received a 2nd kidney transplant
- Five (9.4%) patients developed an aggressive SCC after the 1st transplant
- 14 of the 53 (26.4%) patients had 15 aggressive SCC after the 2nd transplant (median of 50 months; range: 3-97); 4 patients had only local recurrences and 10 patients with metastases
- High mortality



- T1: period of first transplantation; D: period of dialysis; T2: period of second transplantation

Risk Factors for Aggressive SCCs after Retransplantation

- Fair skin type
- Multiple tumors before retransplantation
- Treatment with azathioprine, T cell–depleting antibodies, and delayed revision of immunosuppression
- All associated with an increased risk of aggressive cutaneous SCC after retransplantation

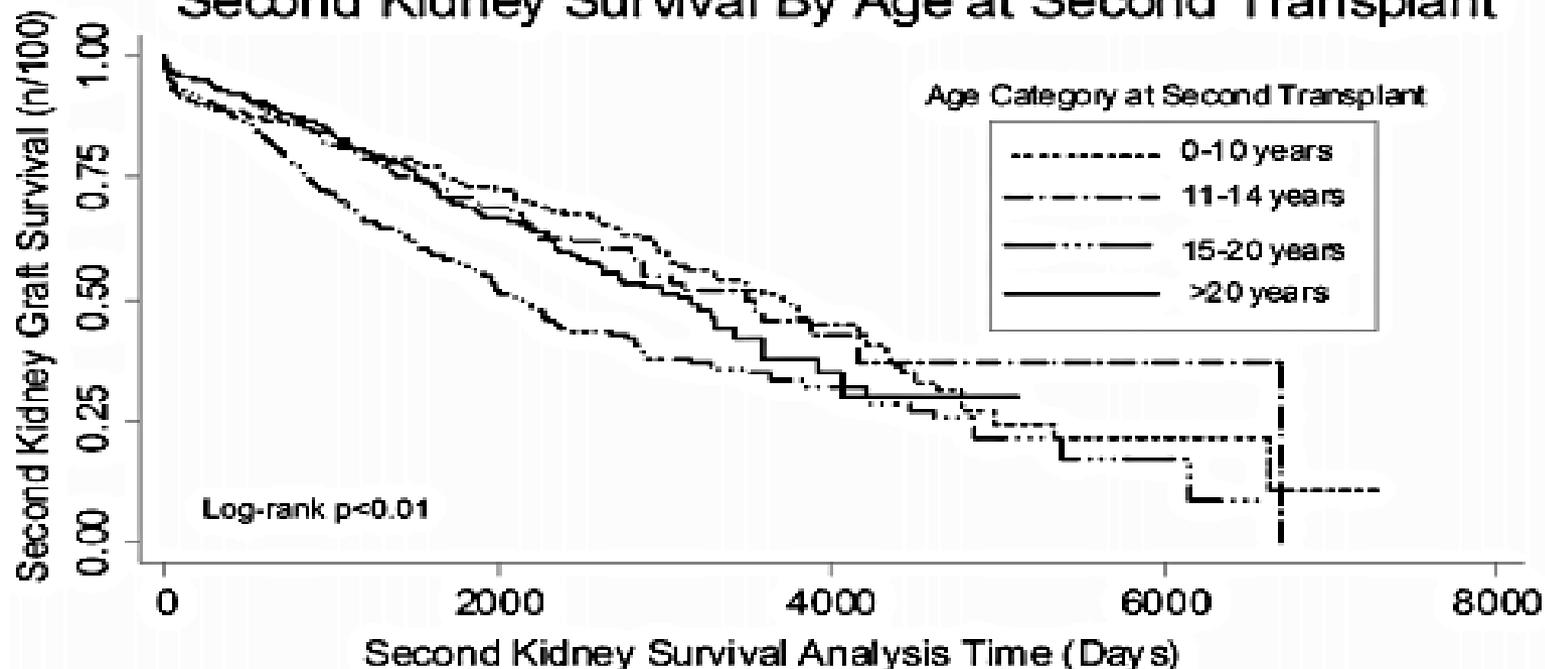
Recommendations-Skin Cancers

- No waiting period is warranted after a single SCC, if no histological features of aggressiveness
- Waiting period of 2 years in case of SCC with histological features of aggressiveness and of 5 years in case of history of metastatic SCC
- Stronger prevention measures, especially in patients who have several risk factors of aggressive SCC; education about strict sun protection and regular dermatologic monitoring
- Tailored immunosuppression

Retransplantation in Children

- Number of patients on the waiting list increasing-impacts access for kids
- 15% of pediatric transplants are retransplants
- Most pediatric recipients will require one or more retransplants in their lifetime
 - 249 pediatric recipients transplanted between 1972-1992 (*Ploos van Amstel S, et al. CJASN 2015*)
 - 36% retransplanted once, 34% retransplanted twice, 17% retransplanted 3 times and 5% retransplanted more than 3 times
 - Cancer was highly prevalent after 25 years of transplantation, with a high rate of recurrence

Second Kidney Survival By Age at Second Transplant



Median Second Kidney Graft Survival by Age at Second Transplant

Age Category at Second Transplant	Median Graft Survival Time
0-10 years	10.2 years
11-14 years	9.5 years
15-20 years	5.8 years
>20 years	8.6 years

- OPTN data: independent of first graft survival, recipients 15-20 years of age at second transplant had worse second kidney GS (log rank $p < 0.01$) and an increased risk for graft failure

Retransplantation in Children and Young Adults

- Survival time of the first kidney and recipient age at second transplant are key factors associated with second kidney transplant outcomes
- Recs: risk stratification, careful investigation of support system, compliance with medications/clinic visits

Recurrent Diseases and Retransplants

- The most common: FSGS
- The incidence of recurrence-quite variable
- No standard therapies or interventions to prevent retransplant recurrence or for prophylaxis
- Most centers are hesitant to retransplant patients with recurrent diseases
- New meds such as eculizumab-more info needed

Retransplantation after PTLD

- All adults who underwent kidney retransplantation after the development of PTLD in France, 1998 and 2015
- 52 adult patients who underwent 55 retransplantations after PTLD (three patients had two retransplantations)
- Transplant that preceded the development of PTLD was the first for 49 patients and the second for three patients.

Caillard S, et al. Clin J Am Soc Nephrol 2017

Table 2. Characteristics of post-transplant lymphoproliferative disorders in the 52 patients who underwent retransplantation

Characteristics	n (%)
PTLD localization (%)	
Unique localization	33 (64)
Multiple localizations	19 (36)
Main localization (%)	
Graft	18 (35)
Lymph nodes/bone marrow	17 (33)
Gastrointestinal tract	7 (13)
Ear, nose, and throat	4 (8)
Central nervous system	4 (8)
Other sites	2 (3)
EBV status (%)	
EBV-positive PTLD	27 (67)
EBV-negative PTLD	13 (33)
Unknown	12
World Health Organization classification (%)	
Early B lesions	3 (7)
Polymorphic B PTLD	5 (12)
Monomorphic PTLD	33 (78)
<i>B cell neoplasms</i>	30
<i>T cell neoplasms</i>	3
Classic Hodgkin lymphoma	1 (2)
Unknown	10

PTLD, post-transplant lymphoproliferative disorder; EBV, Epstein-Barr virus.

- EBV serology was positive in 54 patients
- The mean patient age at retransplantation: 51±12 years old (23-68 years old)
- The mean follow-up starting from the time of retransplantation was 67±50 months (0-186 months)
- The median time from PTLD to retransplantation: 90 months (interquartile range, 71 months; from 28 to 224 months); eight (15%) patients were relisted preemptively

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Table 4. Immunosuppressive regimens used for patients at the time of retransplantation

Immunosuppressive drugs	n (%)
Induction therapy (%), n=55	
IL2RA	23 (42)
IL2RA + IVIg	4 (7)
IL2RA + IVIg + PE	1 (2)
IL2RA + rituximab	1 (2)
IL2RA + IVIg + rituximab	1 (2)
IL2RA + IVIg + PE + rituximab	1 (2)
Antilymphoglobulins	12 (21)
Antilymphoglobulins + IVIg	2 (4)
Antilymphoglobulins + IVIg + rituximab	1 (2)
Antilymphoglobulins + IVIg + PE	1 (2)
Antilymphoglobulins + IVIg + rituximab + PE	1 (2)
IVIg + rituximab	1 (2)
No induction	6 (11)
Maintenance therapy (%), n=55	
Tacrolimus + MMF + steroids	35 (62)
Tacrolimus + MMF	2 (4)
Tacrolimus switched to mTORi + MMF + steroids	7 (13)
Tacrolimus + steroids	1 (2)
Tacrolimus + MMF + sirolimus	1 (2)
Cyclosporin + MMF + steroids	7 (13)
Cyclosporin switched to mTORi + MMF + steroids	2 (4)

•87% of patients had induction; Maintenance immunosuppression: CNI in all pts, MMF in 54 pts and steroids in 52 pts; most patients received a triple immunosuppression; One patient had PTLD recurrence at 24 months posttransplant

Retransplantation-Special Considerations

- Patients with failed grafts are different from transplant-naïve patients
- Status of failed graft-need for nephrectomy
- Sensitization/number of HLA mismatches
- Risk/history of recurrence/cause of prior graft failure
- Technical difficulties
- History of noncompliance
- Type of immunosuppression
- History of infections and cancers

Conclusions

- Increasing number of recipients waitlisted for a retransplant-organ availability is quite limited
- **Survival benefit with retransplantation** compared to remaining on dialysis
- Graft survival advantage in **preemptive second** transplant recipients
- Lower health care cost
- Survival outcomes in re-ECD recipients worse than those in re-SCD recipients
- Increased cancer risk: skin cancers and RCC-
close follow-up posttransplant

Cases

- 36 yo female-s/p transplant from her mother in 2000-was found to have RCC on her left native kidney-**listed with waiting time of 6 months**
- 72 yo male-s/p DD transplant in 2007-h/o cryptococcal meningoencephalitis, mild coronary artery disease, and on warfarin for pulmonary emboli-**not listed**
- 33 yo male-s/p kidney transplant from his wife in 4/2016, stopped taking his meds; treated for AMR-now on dialysis; being evaluated-**not listed**
- 34 yo female-s/p OMM transplant from her sister in 2011-recurrent FSGS, now near dialysis-**listed for time only**
- 36 yo female-s/p DD transplant in 2001-has advanced CKD-diagnosed with breast cancer in 12/2016-**listed and recently activated**