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Message from our President

The Urologic Society for Transplantation and Renal Surgery remains committed to advancing the field of urology and transplantation and continues to create a networking environment fostering international research collaboration and the sharing of best practices.

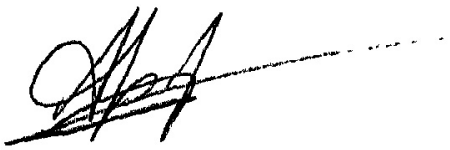
The rapid global spread of the coronavirus has rightfully led to the cancellation of AUA 2020. The planning committee had created an exceptional USTRS program this year, with a new collaborative USTRS-American Society of Transplant Surgeons initiative highlighting Dr. Lloyd Ratner (U.S.) discussing developments in living donor surgery, commemorating the 25th anniversary of the first laparoscopic donor nephrectomy. We were also extremely pleased to have Dr. John Barry (U.S.) speak on renal transplant essentials for urologists, as well as Dr. Alberto Breda (Spain), who was going to highlight novel developments in robotic surgery. We will ensure these speakers are highlighted at our 2021 meeting.

In addition, many of our students, residents, and fellows put a lot of work into completing exceptional projects. The USTRS places tremendous value on mentorship of these younger colleagues, and this venue often helps them launch their careers. The USTRS feels it is extremely important to recognize the individuals who submitted abstracts. All the papers were outstanding, and while it is unfortunate we could not view the presentations in person due to the meeting cancellation, we decided to move forward with publishing all of the conference proceedings in abstract form in this issue of the *Canadian Urological Association Journal* so that the importance of the work can be recognized

We thank the Canadian Urological Association Journal, as well as all our colleagues and industry partners who continue to support the USTRS.

I look forward to seeing you all at AUA 2021!

All the very best,



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Novick podium presentations

2020 NOVICK AWARD WINNER Spencer Mossack, BS, Med. Student

USTRS 2020-POD-1

Imaging characteristics and screening limitations for malignancy in acquired cystic kidney disease and autosomal dominant polycystic kidney disease

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Stony Brook, NY, United States

Introduction: No guidelines exist for detecting malignancy in patients with acquired cystic kidney disease (ACKD) or autosomal-dominant polycystic kidney disease (ADPKD). Imaging options are limited, as many of these patients suffer end-stage renal disease and IV contrast is contraindicated. Ultrasound (US) is of poor value, as these kidneys are often very large and replaced entirely by cysts or very small with difficult-to-define features. Magnetic resonance imaging (MRI) is expensive and not used often for screening. We aimed to determine what imaging characteristics in patients with ACKD or ADPKD could predict malignancy and hoped to inform future options for screening.

Methods: After IRB approval, we collected records of patients with a diagnosis ADPKD or ACKD who had radical nephrectomy performed at our institution from 2007–2019. A list of each patient's imaging studies prior to nephrectomy was acquired. These studies were then read by an experienced genitourinary radiologist who was blinded to the patients' pathology. The findings of each study were coded. We compared the characteristics noted on each study to those with benign vs. malignant pathology.

Results: Eighty computed tomographies (CTs) without contrast were reviewed in 16 patients with ACKD and 20 patients with ADKPD. Cystic septations were seen significantly more frequently in cystic kidneys with malignancy (19.5% vs. 54.5%; p=0.004). There was no significant difference between CTs of benign or malignant kidneys with regards to solid or cystic lesions, calcifications, cyst wall thickness, or other characteristics (Table 1). The sensitivity and specificity of CT scans in this population was 80% and 35.7%, respectively.

Conclusions: Only cystic septation on CT scans of kidneys affected by ACKD and ADPKD was predictive of malignancy on pathology. CT and US are limited modalities for screening this high-risk population. MRI was not used frequently. MRI even without gadolinium is superior for defining individual lesions, characterizing cyst walls, and distinguishing cysts with complex fluid from lesions with intracyst hemorrhage. MRI should be considered for surveillance in patients with renal impairment at increased risk of renal malignancy.

USTRS 2020-POD-1. Table 1

	Benign (n=58)	RCC (n=22)	p
Endophytic (n=60)	14 (34.1%)	8 (42.1%)	0.552
Exophytic (n=60)	27 (65.9%)	11 (57.9%)	0.552
Solid lesion (n=57)	3 (7.5%)	3 (17.6%)	0.419
Cystic lesion (n=57)	37 (92.5%)	14 (82.4%)	0.253
Calcification (n=60)	2 (4.9%)	3 (15.8%)	0.155
Heme (n=60)	9 (22%)	4 (21.1%)	0.937
Walls			0.209
Thick	26 (44.8%)	12 (54.4%)	
Thin	15 (25.9%)	6 (27.3%)	
Thick and thin	0 (0%)	1 (4.5%)	
Septations (n=60)	8 (19.5%)	11 (57.9%)	0.003

RCC: renal cell carcinoma.

USTRS 2020-POD-2

Safely increasing the number of renal transplants performed in a small center through the use of acute kidney injury donors

Shane Batie[1], Kirby Gabrys[2], Fidel Barrantes[2], Kareem Eid[2], Breanna Trujillo[2], Hannah Kerr[2]
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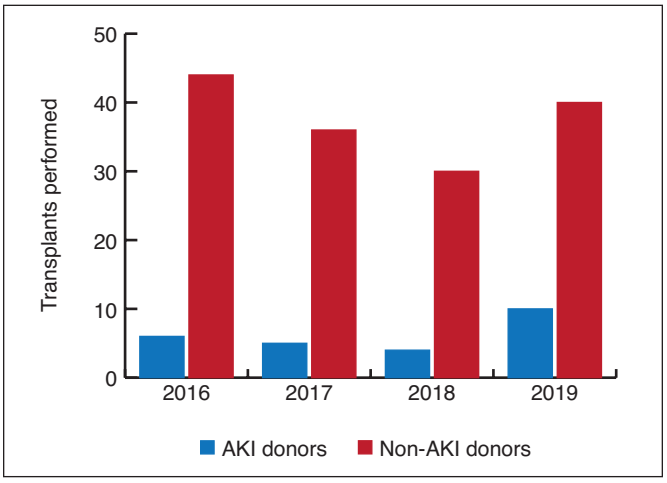
Introduction: New Mexico is a medically underserved state with a significant end-stage renal disease population. This study aims to further demonstrate the safety of using acute kidney injury (AKI) donors to increase the number of allografts available for renal transplantation in a small transplant center.

Methods: We retrospectively reviewed all renal transplants performed at the Presbyterian Healthcare Services Transplant Center from 2016–2019. Delayed graft function (DGF) was defined as the need for dialysis within one week post-transplant. Donor AKI was defined using the Acute Kidney Injury Network (AKIN) definition. Recipient serum creatinine (SCr) values were obtained from the time of last followup at the transplant center.

Results: A total of 175 renal transplants were performed; 25 renal transplants were performed using donor AKI kidneys and 150 renal transplants were performed using non-AKI donor kidneys. Simultaneous kidney and pancreas transplants were not included in the study. Twenty-three of the 25 (92%) AKI donor kidneys were classified as stage 3 AKI per AKIN definition. Two of 25 AKI donor kidneys were classified as stage 2 AKI. Mean peak SCr in the donor AKI kidneys was 5.29 mg/dL (3.5–10.1mg/dL). Mean terminal SCr in the donor AKI kidneys was 5.03 mg/dL (2.19–10.1mg/dL). Six of 25 (24%) of the AKI donor kidneys received hemodialysis prior to organ recovery. Mean AKI donor age was 29.4 years (15–41 years). Mean AKI donor cold time was 21 hours 12 minutes (6 hours 38 minutes–33 hours 21 minutes). Mean AKI donor warm time was 29.4 minutes (21–41 minutes). Twenty-four of 25 AKI donor kidneys were pumped. Fifteen of 25 (60%) of the AKI donor kidney recipients had DGF, in comparison to 21/150 (14%) of the non-AKI donor kidney recipients. At last followup, the mean SCr for donor AKI kidney recipients was 1.19 mg/dL (0.89–1.57mg/dL). There were no primary non-functions. One patient death with a functioning graft in the AKI donor kidney group occurred at 3.5 years post-transplant, unrelated to transplant.

Conclusions: AKI donors remain an underused method to reduce organ discard. Use of these kidneys is safe and an effective way to increase recipient access to transplantation and enhance program growth.



USTRS 2020-POD-2. Fig. 1. Renal transplants performed by year. AKI: acute kidney injury.

USTRS 2020-POD-3

Anterior rectus sheath vs. standard Gibson approach to kidney transplantation: A randomized, double-blind, controlled trial

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Introduction: Anterior rectus sheath approach (ARS) to kidney transplantation (KT) involves incision of the rectus sheath in order to medially retract the rectus muscles to expose the iliac fossa. When compared to the muscle-cutting Gibson approach (GA), retrospective analysis of ARS has demonstrated decreased wound-related complications. Herein, we present preliminary results from a randomized, double-blind, controlled trial comparing the two approaches.

Methods: Patients ≥18 years undergoing KT were enrolled. Exclusion criteria were prior ipsilateral KT, multi-organ transplant, prior urinary or bowel diversion, en bloc or dual KT, need for allograft nephrectomy, and/or extensive vascular calcifications. Randomization was performed by primary surgeons. Participants were blinded to incision-specific details. Data collection and analyses were performed by persons blinded to incision type. The EQ-5D Health Status and Patient and Observer Scar Assessment Scale (POSAS) questionnaires were administered. Student's t-test, Chi-squared, and the Mann-Whitney U test were used to compare continuous, categorical, and ordinal data, respectively. The primary endpoint is wound complications. Secondary endpoints were postoperative pain and analgesic requirements.

Results: As of February 2020, 25 ARS and 35 GA are enrolled. Median Charlson comorbidity index was greater in the ARS group (5 vs. 3; $p<0.01$); otherwise, the group demographics were comparable. In ARS vs. GA, there were no differences in perioperative data, such as operative time (185.8 minutes vs. 216.9 minutes; $p=0.07$), body mass index (27.6 vs. 29.0; $p=0.29$) or length of stay (2-day vs. 2-day; $p=0.99$). Aside from one ARS patient requiring re-operation for fascial dehiscence, there were no wound-related complications ($p=0.42$). Mean incision lengths were significantly less in the ARS group (9.4 cm vs. 13.7 cm; $p<0.01$.). EQ-5D or POSAS scores did not differ. Mean Inpatient Oral Morphine Equivalents (mg) use was lower in the ARS group (43.6 vs. 70.7; $p=0.02$). There was no difference in incision-related pain at two weeks and one month.

Conclusions: At interim analysis, ARS patients require significantly less inpatient narcotic use despite having similar subjective pain reporting. There were no wound or scar perception benefits to ARS.

USTRS 2020-POD-4

Belatacept provides superior inhibition of donor-specific antibody formation in kidney transplant recipients with acute rejection

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Introduction: The factors responsible for chronic renal allograft dysfunction and premature graft loss are incompletely understood and likely multifactorial. Immunologic injury attributable to the formation of donor-specific antibodies (DSAs) is one accepted mechanism contributing to late allograft loss. Selective costimulatory blockade with belatacept has demonstrated long-term improvement in glomerular filtration rate and decreased risk of death and graft loss when compared to calcineurin inhibitor (CNI)-based regimens. Experimental data and post-hoc analyses of clinical trial cohorts have demonstrated a decreased rate of DSA formation with costimulation blockade, suggesting a possible mechanism for the benefits derived from belatacept. To date, in-depth evaluation of DSA formation in belatacept-treated patients has been limited to post-hoc analyses of clinical trial cohorts. The purpose of this study is to evaluate the rate of DSA formation in a large, real-world cohort of patients treated with belatacept-based immunosuppression vs. those treated with CNI-based regimens.

Methods: Retrospective review of our institutional database for all patients undergoing renal transplant at our institution between June 1, 2011 and December 31, 2018 was performed. Patient characteristics, immunosuppression protocol, and history of rejection and DSA formation were extracted from our clinical database and patient medical records. Pediatric and multi-organ recipients were excluded.
Results: A total of 1547 individual renal transplants met inclusion criteria and occurred during the time period specified. Of these, 1018 transplants were treated with a belatacept regimen, while 529 were treated with a CNI-based regimen only. A history of acute cellular rejection (ACR; Grade 1A–3) was similar between the belatacept and CNI-treated patients (32% vs. 27%; p=0.14). Belatacept-treated recipients with a history of acute cellular rejection (ACR), however, were significantly more likely to have experienced multiple episodes of ACR as compared to their CNI-treated counterparts (82% vs. 41%; p<0.001). Despite this, DSA formation remained significantly lower in the belatacept group as compared to the CNI group, both in the presence of ACR (21% vs. 32%; p<0.01) and in its absence (4% vs. 12%; p<0.001).
Conclusions: In renal transplant recipients with ACR, belatacept-treated patients experience a lower rate of DSA formation as compared to their CNI-treated counterparts, even in the setting of multiple rejection episodes. The preferential inhibition of DSA formation by belatacept may partially underlie the long-term benefits of belatacept observed in clinical trials.

USTRS 2020-POD-5

Impact of timing of bilateral nephrectomy in patients with polycystic kidney disease undergoing kidney transplantation

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Introduction: In patients with autosomal-dominant polycystic kidney disease (ADPKD) undergoing kidney transplantation with an indication for pre-transplant nephrectomy, the optimal timing of nephrectomy is undefined. In this study, we sought to compare safety and outcomes of patients who received a kidney transplant and bilateral nephrectomy in either a simultaneous or staged approach at our institution.
Methods: A retrospective review of all adult patients with ADPKD who received a kidney transplant and underwent bilateral nephrectomy between January 2008 and December 2019 was performed. Patients were divided into two groups based on timing of nephrectomy: staged (nephrectomy prior to transplant) and simultaneous (nephrectomy at the time of transplant). The primary outcome was 90-day Clavien-Dindo (CD) complication rates. Secondary outcomes included operative time, transfusion rate, length of stay, and renal function at one year. In the staged group, the outcomes were handled as an aggregate of both the nephrectomy and transplant procedures to facilitate comparison between groups. T-test, Mann-Whitney U, and Chi-squared were used where appropriate with an alpha of 0.05.
Results: A total of 114 patients with ADPKD received a kidney transplant over an 11-year period. Of these, 28 patients underwent both nephrectomy and transplantation and were included in the final analysis (10 staged; 18 simultaneous). Mean age (years) at time of transplant was 56 in the simultaneous group and 57 (8.4) in the staged group (p=0.68). No significant difference was observed in overall complication rates (CD grade 1–5) between the groups (78% vs. 70%; p=0.67), nor was the frequency CD complications >2 different between groups (p=0.45). Most complications recorded were due to blood transfusion (CD grade 2). The majority of patients in the simultaneous group had a living donor transplant (83% vs. 0%; p<0.001). Total surgical time did not differ between groups (simultaneous 338 minutes vs. staged 382 minutes; p=0.06). The transfusion rate was also not different between groups (simultaneous 50% vs. staged 40%; p=0.91). Total length of stay was significantly lower in the simultaneous group as compared to the staged group (8.1 days vs. 14.5 days; p<0.001). Creatinine (μmol/L) at one year did not differ between groups (113 vs. 127; p=0.12).
Conclusions: These data suggest similar 90-day complication rates between a simultaneous and staged approach, with significantly lower length of stay. Future analysis of cost differential warrants further study to clarify the role of simultaneous vs. staged approaches.

USTRS 2020-POD-6

Does the Mayo Adhesive Probability score predict the presence of adherent perinephric fat at the time of hand-assisted laparoscopic donor nephrectomy?

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Mayo Clinic Jacksonville, FL, United States
Introduction: The Mayo Adhesive Probability (MAP) score is an image-based measurement of perinephric fat and stranding that has been shown to be a reliable predictor of adherent perinephric fat (APF) during partial nephrectomy. The purpose of this study is to evaluate the ability of the MAP score to predict surgeon identification of APF at the time of hand-assisted laparoscopic donor nephrectomy (HALDN).
Methods: A total of 61 patients undergoing HALDN at our institution were reviewed with intraoperative determination of APF by the transplant surgeon. The probability of APF according the MAP score was estimated from a single variable logistic regression model. The ability of the MAP score to predict APF at the time of surgery was estimated using the area under the receiver operating characteristic (ROC) curve.
Results: A total of 61 patients who underwent HALDN at our institution between October 2014 and June 2018 had surgeon identification of the presence or absence of APF at the time of surgery. Among the 61 donor nephrectomy patients with mean age of 45 years and body mass index of 26.5 kg/m^2, 38 (62.3%) patients had MAP score of 0 and 23 (37.7%) patients had MAP score 1–4. Three of 38 patients with MAP score of 0 (8%) and 13 of 23 patients with MAP score 1–4 (57%) had surgeon identification of APF during the case. The logistic regression model with MAP score as a linear predictor of the log odds of APF had an area under the ROC curve of 0.81 (95% confidence interval 0.68–0.93), indicating good ability of the MAP score to discriminate between identification of APF and no APF at the time of surgery for patients undergoing HALDN.
Conclusions: The MAP score is a reliable, image-based measurement that can be used to predict the presence of APF during HALDN.

Industry hour

USTRS 2020-IND-1

The use of a muscle pump activator device reduces both duration of hospitalization and improves early graft outcomes following kidney transplantation: Final results from a single-institution, randomized, controlled trial

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Introduction: Kidney and simultaneous pancreas-kidney (SPK) transplant recipients can have prolonged postoperative hospitalization secondary to a number of factors, including delayed-graft function, delayed mobilization, and edema. Fluid management after renal transplantation can be challenging. The need to provide adequate pre-load to perfuse the newly transplanted allograft can conflict with efforts to avoid volume overload. TED stockings with intermittent pneumatic compression devices (TED+IPC) have been used to improve venous return during the perioperative period. The objective of this trial was to evaluate the effects of TED+IPC vs. a muscle pump activator (MPA, geko™, PerfuseMedTec) (Fig. 1) device on factors that could reduce postoperative complications and duration of hospitalization.
Methods: In this single-center, prospective, randomized, controlled trial, 221 kidney and SPK transplant recipients were randomized to either wearing TED+IPC or MPA for six days postoperatively. Exclusion criteria included age <18 years, history of deep vein thrombosis, history of leg amputation, body mass index >36, use of an implantable cardiac defibrillator, presence of deep brain stimulators, other contraindications to use of electrical stimulation devices, lack of ability to understand the risks and benefits of the study, and those who could not tolerate the MPA device stimulation. Induction immunosuppressive therapy consisted of antithymocyte globulin (5–8 mg/kg IV) or basiliximab (20 mg IV on postoperative days 0 and 4), depending on the recipient's immunological risk. Maintenance immunosuppressive regimen consisted of prednisone, tacrolimus, and mycophenolic acid, and were initiated while in hospital for all recipients. Groups were compared with respect to postoperative urine output, lower limb edema, weight, days in hospital, mobility, serum creatinine, delayed graft function, need for dialysis, and lower extremity blood flow (Table 1).
Results: We discovered that patients in the MPA group had significantly higher urine output and less increase in mid-calf leg circumference and weight gain compared to the TED+IPC group (p=0.003, p=0.001, and p=0.003, respectively). The MPA group also experienced shorter hospitalization (p=0.038), higher femoral vein velocity (p=0.001), and took more steps (p=0.009). Incidence of delayed graft function (p=0.72) and number of dialysis runs (p=0.39) were not different between study groups. Subgroup analysis of primary endpoints in donation after cardiac death recipients and SPK recipients did not yield any significance between the study arms.
Conclusions: Postoperative use of an MPA device decreases duration of hospitalization after kidney transplantation compared to when TED+IPC is used. This may be attributable to improved maintenance of intravascular volume leading to improved renal blood flow to the transplant allograft and, thus, increased urine output and decreased fluid retention. Further studies looking at long-term outcomes and with focus on the donation after cardiac death kidney transplant population are needed.

USTRS 2020-IND-1. Fig. 1. The geko™ (PerfuseMedTec) device worn as a band over the legs bilaterally, just inferior to the fibular head.

USTRS 2020-IND-1. Table 1. Baseline recipient characteristics and primary endpoint analysis by donor type

	Recipient intervention		
	TED+IPC	MPA	p
Number of participants	111	110	–
Age, years	51.5±13.4	52.9±13.2	0.43
Male:female	64:47	69:41	0.44
Weight	77.47±16.9	78.71±17.6	0.59
Body mass index (kg/m²)	27.39±5.2	27.02±4.7	0.58
Type of dialysis			0.79
Hemodialysis	69	67	
Peritoneal dialysis	30	28	
Pre-emptive	12	15	
Type of donor, n			0.27
Living donor	30	22	
Donation after brain death	55	54	
Donation after cardiac death	26	34	
Urine output, mL			
All transplants	12595	15986	0.004
Kidney transplant	12457	16325	0.015
Kidney/pancreas transplant	4933	9662	0.98
Living donor			
Urine output, mL	18902	23989	0.009
Weight, kg	4.90	2.82	0.005
Calf size, cm	3.23	2.27	0.010
Donation after brain death			
Urine output, mL	12832	19292	<0.001
Weight, kg	4.87	3.91	0.05
Calf size, cm	3.65	2.26	<0.001
Donation after cardiac death			
Urine output, mL	4815	5496	0.27
Weight, kg	6.04	4.97	0.23
Calf size, cm	3.81	3.00	0.08

Urine output, weight, and calf size were significantly different between the TED+IPC and the MPA recipients. IPC: intermittent pneumatic compression; MPA: muscle pump activator.

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Poster presentations

USTRS 2020-1

Live kidney donor allograft lithiasis: A systematic review of stone-related morbidity in donors

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Introduction: Nephrolithiasis has traditionally been a relative contraindication to live kidney donation. Donor safety is inherently the primary concern for the donor surgeon. The ramifications of stone recurrence in a solitary kidney are important concerns that influence donor eligibility. Use of computed tomography for screening of live donor candidates has led to an increase in incidental detection of kidney stones. However, the clinical significance of these findings is unclear. We aim to summarize the totality of published evidence on the stone-related morbidity of patients who proceeded with live donation of their kidney despite incidental findings of urolithiasis on their preoperative workup.

Methods: We conducted a systematic review based on standards in concordance with the Preferred Reporting Items for Systematic Reviews. A comprehensive literature search of MEDLINE, Embase, and Cochrane databases was performed to identify studies that documented the outcomes of live donors who had incidental findings of urolithiasis.

Results: Ten studies and 162 live donors with asymptomatic urolithiasis were identified. The average prevalence of incidental urolithiasis among live donors was 5.8%. The majority of studies included donors with small stones, with a mean stone size of 3.6 mm (1–16). Eight patients had bilateral stones. In eight studies, a positive metabolic workup and history of previous stone disease was a contraindication to donation. In all except two of the reviewed studies, the kidney with the stone had been donated. Eleven (6.8%) patients had their contralateral kidney without stones donated. At a mean followup of 20.6 months (2–79.3), there was one (0.6%) donor who had a stone-related event. This patient had donated their contralateral kidney without a stone.

Conclusions: Surgeons who participate in live donor selection should remain advocates for the donor. The availability of long-term outcomes data on stone-related morbidity for donors is limited. It would appear that the risk of stone-related morbidity in kidney donors is low but not insignificant. In view of chronic organ shortages, striking the balance between beneficence to the recipient and non-maleficence to the donor is challenging at times. We believe that in the absence of robust, long-term outcome data, incidental urolithiasis found during live donor workup should not be an impediment to donation with the caveat that the risk of stone-related morbidity should be minimized by donating the kidney with the stone. Recurrent stone-formers, bilateral stone disease, and those with metabolic abnormalities should be excluded from donation.

USTRS 2020-2

Transplantation of pediatric renal allografts from donors aged one year and under: An analysis of the Australian and New Zealand Dialysis and Transplant Registry (ANZDATA) from 1963–2018

Jinna Yao[1,2,3], Philip Clayton[4], Harsham Choksi[3], David Tovmassian[1], Taina Lee[3,5], Howard Lau[1,2], Richard Allen[1,3], Lawrence Yuen[1,3], Jerome Laurence[3,5], Henry Pleass[1,3]
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Introduction: Recent times have seen a change in donor demographics internationally in order to mitigate the shortage of organs. While there is established evidence that transplantation with pediatric kidneys yields good outcomes, there exists reluctance in many centers to use organs from very small pediatric donors due to high thrombosis risk and concerns regarding low nephron mass. We describe the collective experience of transplantation using kidneys from small pediatric donors aged one year and under in Australian and New Zealand.

Methods: We analyzed the ANZDATA registry on all deceased donor kidney transplants from pediatric donors aged one year and under. We compared the recipient characteristics and outcomes between 1963–1999 and 2000–2018.

Results: From 1963–1999, 16 transplants were performed in nine (56%) adults and seven (44%) children. Donor and recipient characteristics are listed in Table 1. Death-censored graft survival was 50% and 43% at one and five years, respectively, and was superior in adults (p=0.0001). There was a higher incidence of vascular thrombosis (38% vs. 9%) and acute rejection (25% vs. 3%) in pediatric recipients compared to adult recipients. Patient survival was 75% and 69% at one and five years, respectively, with no difference observed between pediatric and adult recipients (p=0.70). Causes of graft loss included acute rejection (19%), thrombosis (13%), hemolytic uremia syndrome (6%), cortical necrosis (6%), and death with functioning graft (19%). From 2000–2018, 26 transplants were performed in 25 (96%) adults and one (4%) child. All kidneys were transplanted en bloc. Mean creatinine was 89 mmol/L and 73mmol/L at one year and five years, respectively. Death-censored graft survival was 85% at one and five years. Patient survival was 100% at one and five years. Delayed graft function occurred in 15%. Causes of graft failure were thrombosis (8%) and death with functioning graft (15%).

Conclusions: Kidneys from very small donors have the potential to significantly expand the donor pool. These results favor the use of small pediatric kidney donors for adult recipients with selected recipients under appropriate circumstances.

USTRS 2020-2. Table 1. Donor and recipient characteristics

	Child (1963–1999)	Child (2000–2018)	Adult (1963–1999)	Adult (2000–2018)
n	7	1	9	25
Donor weight, median (IQR)	14 (12, 15)	10 (10, 10)	12 (10, 15)	11 (10, 12)
Donor gender				
Female	3 (50%)	0 (0%)	4 (50%)	6 (24%)
Male	3 (50%)	1 (100%)	4 (50%)	19 (76%)
Total ischemia, median (IQR)	14 (8, 19)	14 (14, 14)	14.5 (10, 17.5)	13 (11, 15)
Age at transplant, median (IQR)	4 (1, 10)	16 (16, 16)	46 (40, 50)	45 (37, 48)
Recipient weight (kg), median (IQR)	21 (12, 27)	48 (48, 48)	59 (55, 65.5)	70 (64, 89)
Recipient gender				
Female	3 (43%)	0 (0%)	3 (33%)	9 (36%)
Male	4 (57%)	1 (100%)	6 (67%)	16 (64%)
Waiting time (years), median (IQR)	0.6 (0.2, 1.1)	0.2 (0.2, 0.2)	2.2 (1.1, 4.7)	4.6 (2.7, 5.7)
Graft number				
1	7 (100%)	1 (100%)	9 (100%)	21 (84%)
2	0 (0%)	0 (0%)	0 (0%)	4 (16%)

IQR: interquartile range.

USTRS 2020-3

Preoperative characteristics that influence robotic vs. open approach to partial nephrectomy for renal masses under 7 cm

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Introduction: Partial nephrectomy is the recommended surgical treatment for T1 renal tumors. The purpose of this study is to identify preoperative characteristics that influence whether partial nephrectomy is performed using an open or robotic approach.

Methods: We performed a 10-year retrospective review of 523 patients who underwent partial nephrectomy at a single institution by one fellowship robotic-trained surgeon from 2008–2019 for tumors under 7 cm in size, comparing preoperative characteristics between open and robotic cases. Patient characteristics included age, sex, weight, body mass index (BMI), medical comorbidities, history of solitary kidney, and history of prior abdominal surgery. Tumor characteristics included renal mass size, location, % exophytic, proximity to the collecting system, Mayo Adhesive Probability (MAP) score, and R.E.N.A.L. score.

Results: A total of 102 patients underwent open partial nephrectomy (OPN) and a total of 421 patients underwent robotic partial nephrectomy (RPN) during the study period. There was a similar male-to-female distribution in those undergoing OPN (70% M, 29% F) and RPN (61% M and 39% F) (p=0.0865). Mean age was 63.5 years for OPN and 61 years for RPN (p=0.0589). OPN and RPN patients had similar mean weight in kg (90.9 vs. 88.4 kg; p=0.1197) and mean BMI (30.1 vs. 30.1; p=0.4306). OPN patients were more likely to have hypertension prior to surgery (74.5% vs. 61.8%, p=0.0158) and history of a solitary kidney (9.8% vs. 1.7%, p=0.0003). A smaller percentage of OPN patients had history of prior abdominal surgery (52.9% vs. 62.6% RPN), but the difference was insignificant (p=0.0897). In regards to tumor characteristics, OPN patients were more likely to have a larger renal mass size (mean 4.6 vs. 3.1 cm; p<0.0001), renal mass located posterior (71.7% vs. 55.8%; p=0.0088), renal mass ≥50% exophytic (56.9 vs. 28.3%; p<0.0001), renal mass located <4 mm from the collecting system (72.5% vs. 56.3%; p=0.008), and a higher MAP score (median 3 vs. 1,; p<0.0001). Mean R.E.N.A.L. score was 7.5 (p=0.4480) for both OPN (range 4–12) and RPN (range 4–11).

Conclusions: Selection of open approach for partial nephrectomy of T1 tumors at our institution appears to be influenced by presence of solitary kidney, larger renal mass size, posterior tumor location, proximity to the collecting system, and elevated MAP score.

USTRS 2020-4

Hemopatch parenchymal closure technique and initial outcomes during robot-assisted partial nephrectomy

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Introduction: The Hemopatch is a novel polyethylene glycol-coated (PEG-coated) collagen patch that acts as a topical hemostatic agent. It has been applied to a variety of surgical techniques. Here, we present our initial series using it for robot-assisted laparoscopic partial nephrectomy (RAPN).

Methods: We conducted a retrospective chart review of all patients undergoing RAPN by a single surgeon at a tertiary Canadian medical center between July and December 2018. We excluded patients if they did not have 90 days' followup or a Hemopatch was not used on the renal parenchymal defect. We collected data pertaining to demographics, renal tumor complexity (RENAL nephrometry score), and postoperative outcomes. This included 90-day complications (using Clavien-Dindo classification), 90-day arterial embolization, estimated blood loss (EBL), change in postoperative hemoglobin, clamp method, and length of stay (LOS). Descriptive statistics were used to examine our outcomes. We also describe in detail our "gloved sleeping bag" technique for Hemopatch deployment.

Results: A total of 17 patients met inclusion criteria, of whom 12 were male. Mean age was 63 years old. Median size of renal mass was 2.85 cm in largest dimension, and median RENAL score was 6. Hilar clamping was carried out in 12 (70.9%) cases, with an average warm ischemic time of 16.1 minutes. The remainder of cases were performed off-clamp. Median EBL was 238 mL and the mean change in hemoglobin on postoperative day 1 compared to preoperatively was 21.2 g/L. Average LOS was 1.76 days. No patient underwent angioembolization for bleeding within 90 days and there were no complications greater than Clavien-Dindo grade 2. One patient developed a urinary tract infection and a second developed postoperative urinary retention.

Conclusions: Hemopatch can be used safely and effectively in lieu of traditional two-layer renorrhaphy with acceptable outcomes. Larger prospective series are required to ascertain its true value and cost-effectiveness.

USTRS 2020-5

Robotic-assisted donor nephrectomy: Impact on surgical outcomes at a single center

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Introduction: While the laparoscopic approach remains the most common technique for donor nephrectomy, the robotic-assisted approach has gained increased use. We sought to compare outcomes for laparoscopic and robotic-assisted donor nephrectomies at a single center.

Methods: A retrospective review of 58 consecutive donor nephrectomies over a four-year period by two surgeons from 2015–2019 was performed. Cases were stratified by robotic or laparoscopic approach, and demographic and outcomes data were analyzed using independent-sample student's t-tests.

Results: Robotic-assisted (n=32) and laparoscopic (n=26) donors were comparable in terms of body mass index (28.1 vs. 26.2; p=0.93); robotic patients were slightly older (age 46.7 vs. 39.3 years; p=0.04). All laparoscopic donors had a single artery and a single vein, whereas six of the robotic-assisted cases (21.8%) had more complex vascular anatomy. Both left- (n=26) and right-sided (n=8) procedures were performed robotically. Estimated blood loss (66.4 vs. 62.5 mL; p=0.81) and length of stay (1.6 vs. 1.5 days; p=0.37) were similar between groups. Change in creatinine from preoperative visit to one-week postoperative followup was similar between groups (-0.45 vs. -0.45; p=0.97). Warm ischemia time (WIT) was longer in the robotic group overall (7.36 vs. 5.15 minutes; p=0.001). This difference was no longer statistically significant when only cases using a gel port for extraction (n=30) were included (7.0 vs. 6.38 minutes; p=0.54). Case duration was longer for robotic-assisted approach (306 vs. 247 minutes; p=0.001); however, when only considering robotic cases performed in the past year, operative times were no longer significantly different (261 vs. 247 minutes; p=0.53). There were no Clavien grade II or greater complication in the laparoscopic group and one in the robotic group: a postoperative ventral incisional hernia that required elective repair four months postoperatively. No cases required conversion to open.

Conclusions: Our data agree with previous reports that robotic-assisted laparoscopic nephrectomy is safe and has similar outcomes to laparoscopic donor nephrectomy. Longer case duration in the robotic group was attributed to the learning curve associated with a new technique, with later robotic cases comparable to laparoscopic operative times. The robotic approach was associated with slightly longer WIT in cases where a midline or Pfannenstiel incision was extended and gel port was not used for extraction.

USTRS 2020-6

Robotic stapler use in robotic-assisted donor nephrectomy: Is it safe?

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Introduction: Robotic-assisted approaches for robotic donor nephrectomy continue to gain traction in the transplant community. The advent of the robotic stapler in 2015 allowed for increased surgeon control and flexibility when securing the renal vessels during donor nephrectomy. Still, the risk of stapler misfire and other complications exists. We sought to retrospectively review our use of a robotic stapler in donor nephrectomies and compare patient outcomes to handheld laparoscopic staplers.

Methods: A total of 32 consecutive robotic-assisted donor nephrectomies by a single surgeon were retrospectively reviewed. Cases were grouped by robotic or handheld laparoscopic stapler use. Variables including estimated blood loss (EBL), length of stay (LOS), warm ischemia time (WIT), and robotic console time were compared using unpaired, two-tailed T-tests with alpha level 0.05.

Results: Patients in robotic stapler (n=20) and handheld stapler (n=12) cases were comparable in terms of body mass index (28.3 vs. 29.9; p=0.80) and age (47.4 vs. 45.7; p=0.74). Fifteen of 20 (25%) robotic stapler patients and two of 10 (17%) handheld stapler patients had multiple renal arteries or veins. Eighteen of 20 (90%) of robotic stapler cases were left-sided vs. eight of 12 (67%) for handheld cases. EBL (57.1 vs. 82.1 mL; p=0.34) and LOS (1.7 vs. 1.6 days; p=0.66) were not significantly different between groups. WIT (7.11 vs. 7.78 minutes; p=0.64) and robotic console time (210 vs. 206 minutes; p=0.84) were comparable. There were no major intraoperative complications or stapler misfires in either group. No cases required conversion to open. There was one Clavien grade II or greater complication in the handheld stapler group: a ventral incisional hernia that required elective outpatient repair (Clavien IIIb).

Conclusions: Our data agree with our previous report that use of a robotic stapler in robotic-assisted donor nephrectomy is safe and feasible. Additionally, we note comparable outcomes to laparoscopic stapler use in terms of EBL, WIT, and robotic console time. Additional randomized, prospective studies are needed to verify these findings.

USTRS 2020-7

Single-port robot-assisted kidney transplantation

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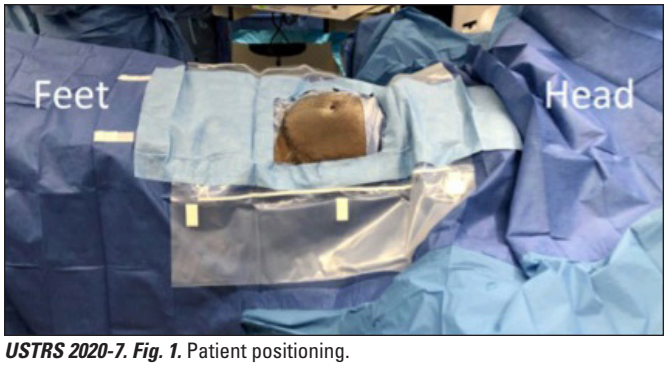
Introduction: Innovative methods are needed to further optimize safe outcomes in kidney transplantation (KT), especially among high-risk recipients (i.e., high body mass index [BMI]). The SP® robot allows for placement of a camera and three articulating arms via a single multichannel port. We present a single case experience with SP robotic KT.

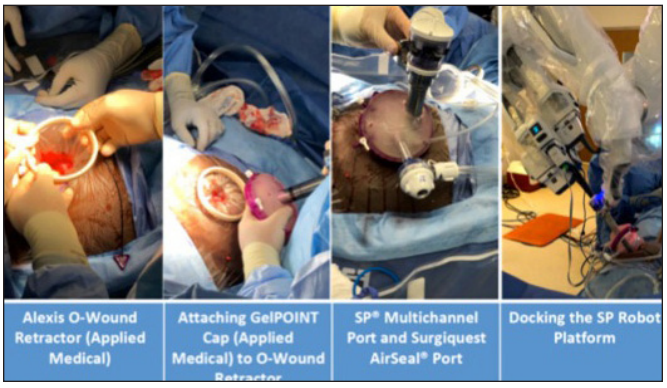
Methods: Patient is positioned (Fig. 1). A 5 cm infra-umbilical abdominal incision is made (Fig. 2). Alexis® O Wound Retractor is placed/attached to the GelPOINT Advanced Access Platform®. Multichannel SP cannula and Surgiquest AirSeal® port are placed through GelPOINT cap. The robot is docked with insufflation (Fig. 3). Right external iliac (EI) vessels are prepared (Fig. 4). The bladder dome is isolated. Deceased donor allograft is prepared (Fig. 5). Donor kidney is introduced, insufflation re-initiated and robot re-docked. Donor kidney is positioned medially with the hilum placed in proximity to the EI vessels. Bulldog clamps are placed on the EI vein. Venotomy is made. The donor renal vein anastomosis is completed in running end-to-side fashion with Gore-Tex® CV5 suture (Fig. 6). The donor renal artery is sewn to EI artery in similar fashion (Fig. 7). Clamps are removed and kidney re-perfused. Kidney is rotated to rest on the psoas muscle. A 4.6 F x 14 cm ureteral stent is placed and urinary bladder/ureter are anastomosed with 4-0 vicryl sutures in continuous direct onlay fashion (Fig. 8). Three-point nephropexy is performed. Fascia/skin are closed (Fig. 9).

Results: The patient was a 30-year-old female with hypertension and end-stage renal disease. She had been on peritoneal dialysis for 40 months with normal urine output. BMI was 38 kg/m^2. She received approximately 6 mg/kg of antithymocyte globulin for induction immunotherapy. Operative time was 301 minutes, revascularization time was 57 minutes (vein 30 minutes, artery 27 minutes). Cold ischemic time was 404 minutes. Estimated blood loss was 50 mL. Hospital length of stay was two



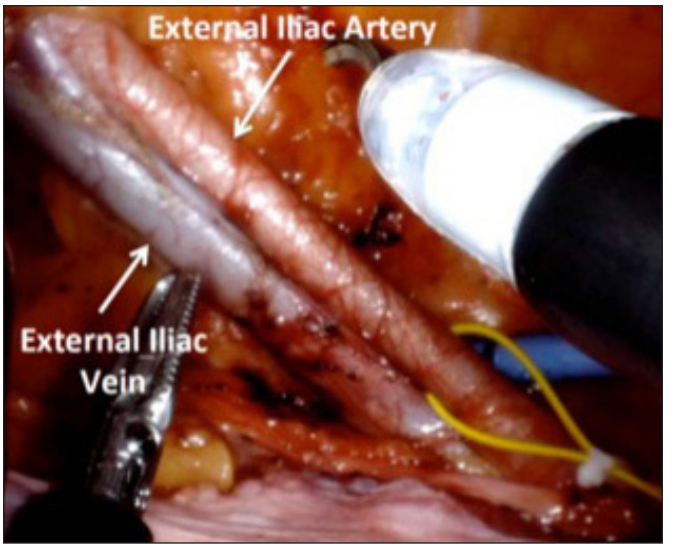
USTRS 2020-7. Fig. 1. Patient positioning.

USTRS 2020-7. Fig. 2. Preparation of 5 cm infra-umbilical abdominal incision.

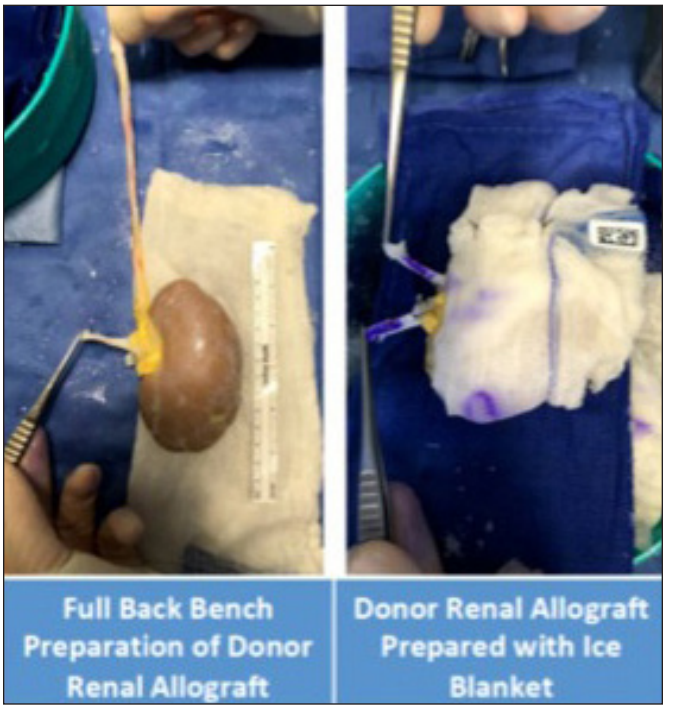


USTRS 2020-7. Fig. 3. Single-port access with the SP® robotic platform.

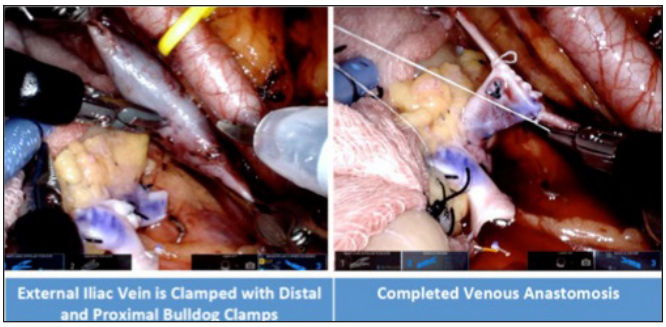
days. Serum creatinine was 14.3, 10.6, 4.6, 2.5, and 1.8 mg/dL on days 0, 2, 7, 14, and 42 after surgery. There were no complications.
Conclusions: This is the first case showing the feasibility of the SP robotic platform in KT. Benefits may include reduced number of incisions required in multiport robotic surgery, reduced length of stay, and smaller incisions in high-risk patients.



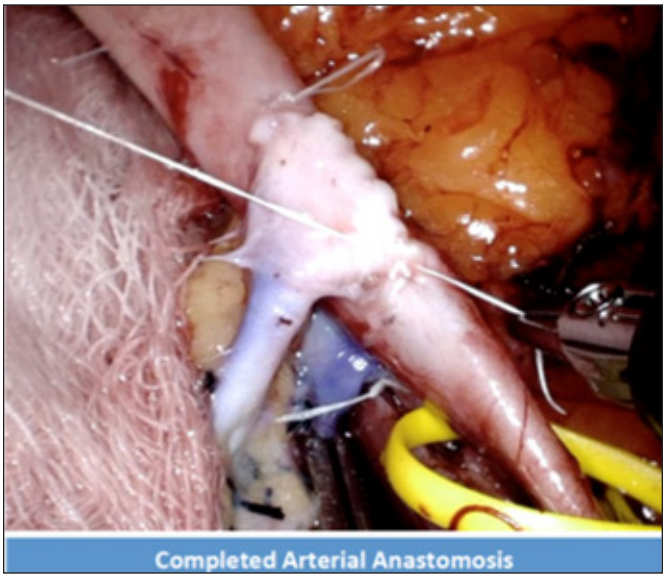
USTRS 2020-7. Fig. 4. Preparation of the recipient external iliac vessels.



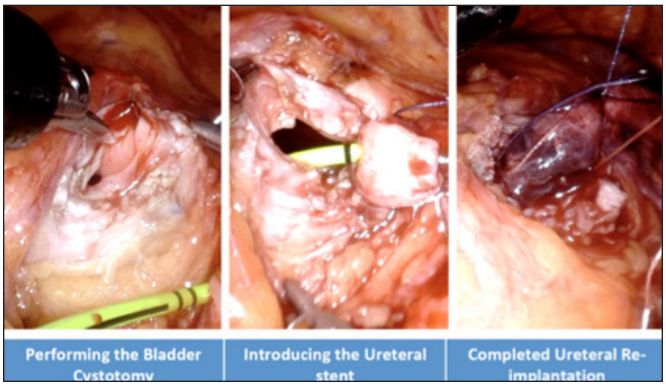
USTRS 2020-7. Fig. 5. Bench preparation of the deceased donor renal allograft.



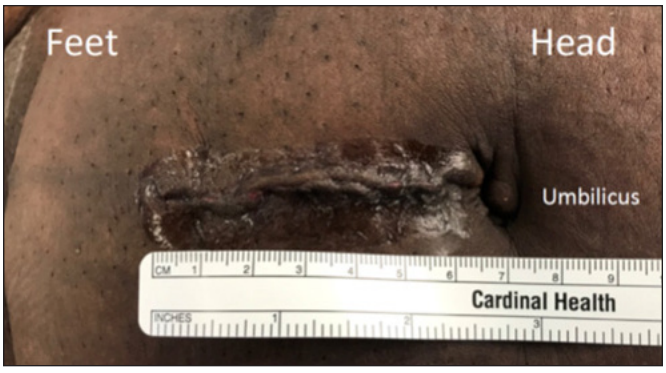
USTRS 2020-7. Fig. 6. Venous anastomosis.



USTRS 2020-7. Fig. 7 Arterial anastomosis.



USTRS 2020-7. Fig. 8. Ureteral anastomosis.



USTRS 2020-7. Fig. 9. Final infra-umbilical incision.

USTRS 2020-8

Urology transplant training in residency: Report of our 45+ years' experience from current and past residents

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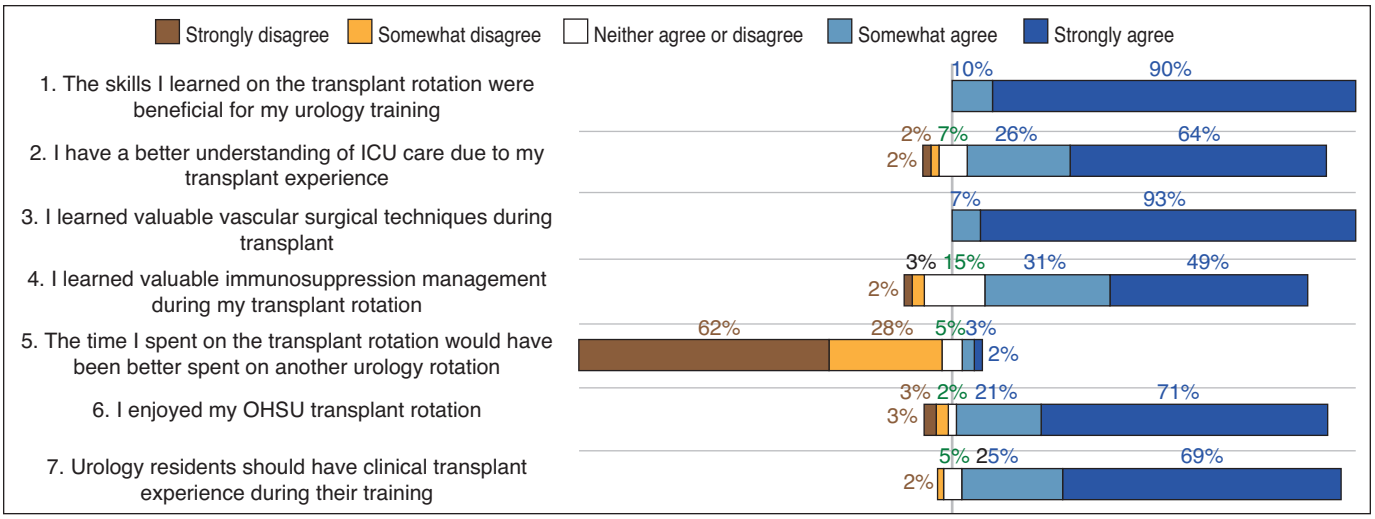
Introduction: Renal transplantation during urology residency is not a requirement in the United States, and exposure to kidney transplantation during urology residency has declined significantly over the past few decades. If not a formal requirement, and if practicing urologists are rarely performing kidney transplants, does exposure to transplantation add any meaningful value to urology training? At our institution, transplantation has been a core component of urology residency since its inception. We sought to determine the value of this training by surveying all current and past residents.

Methods: A 15-question anonymous survey was developed. The first eight questions queried demographics and the last seven were a set of questions with a Likert scale response. The survey was electronically mailed to the past and current urology residents that completed the transplant rotation, dating back to 1972.

Results: A total of 61 of 98 (62%) individuals responded. The majority of the responders were graduates greater than 20 years ago (48%); 41% graduated within the last 20 years, and 11% were current residents. The transplant rotation was >3 months for 66% of the responders. Most (59%) responders were general urologists, and only one responder formally specialized in transplantation; 51% of responders work in a private setting. The median number of kidney transplants performed during the rotation was 30 (interquartile range [IQR] 20–45). Only 17% performed kidney transplants and only 28% performed donor nephrectomies. The Likert scale subjective responses regarding the transplant experience at our institution is shown in Fig. 1.

Conclusions: There are many limitations to this study, such as single institution, selection and recall biases. The majority of graduates did not perform transplants in their practice, yet 100% of responders agreed that the skills learned on the transplant rotation were beneficial for urology training and 94% expressed that urology residents should have clinical transplant experience during their training. While most urology residencies have substantially decreased exposure to kidney transplantation, few programs across the nation remain dedicated to maintaining renal transplantation as an integral part of training. The transplant rotation can be mentally and physically demanding; however, the unique vascular and open surgical skills learned are invaluable to urologic surgical training.



USTRS 2020-8. Fig. 1. Likert response to transplant experience. ICU: intensive care unit; OHSU: Oregon Health and Science University.

USTRS 2020-9

Length of renal replacement therapy is the major risk factor for renal cell carcinoma for patients with acquired cystic kidney disease with or without renal transplant

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Introduction: Renal cell carcinoma (RCC) develops after transplantation with a prevalence of 5% and contributes to the 26% 10-year mortality in kidney transplant recipients (KTRs). Acquired cystic kidney disease (ACKD) is a well-known complication of renal replacement therapy (RRT) and is another known risk factor for development of RCC. Renal transplantation is believed to hinder the development or progression of ACKD in native kidneys. However, RCC associated with ACKD in KTRs is a feared progression of disease, as these tumors are more aggressive after transplantation. We sought to evaluate whether renal transplantation affected the risk factors of developing RCC in patients with a known history of ACKD.

Methods: After IRB approval, we retrospectively reviewed the records of patients undergoing native radical nephrectomy at our institution from 2007–2019. We selected patients with both RCC and ACKD reported on pathology. We then evaluated transplant status, tumor characteristics, demographics, and risk factors for RCC.

Results: We reviewed 451 records. Twenty-three patients and 24 renal units met criteria: 12 were KTRs, 12 were not. There was no significant difference in length of RRT, gender, or tumor size between patients with or without a renal transplant. Pathologic subtypes were similar between groups. Time between initiation of RRT and nephrectomy was longer in the transplanted group. Median time (IQR) between nephrectomy and transplant was 3402 (3539) days.

Conclusions: The length of time a patient is on RRT is the major risk factor for RCC in ACKD kidneys regardless of transplant status. Among patients with ACKD who also had RCC, time on RRT was not significantly different between patients with or without a renal transplant. As KTRs undergo pre-transplantation imaging, it is unclear if these tumors developed de novo after transplantation or were subclinical at the time of transplantation and became evident post-transplant. Treatment strategy in KTRs can include m-TOR inhibitors approved for use as immunosuppressive agents, as well as for renal cancer treatment. Malignancy remains a significant risk in KTRs. Our findings support screening post-transplant, especially in those patients with evidence of ACKD.

USTRS 2020-9. Table 1

	Patients with ACKD: Non-transplant patients (n=12)	Kidney transplant recipients with ACKD (n-12)	p
Age at surgery	59.5±12.9	54.9±11.3	0.343
Gender (% male)	9 (75%)	11 (91.7%)	0.273
Race (n=20)			0.343
White	6 (54.5%)	3 (33.3%)	
Non-White	5 (45.5%)	6 (66.7%)	
Smoking history (% yes) (n=23)	3 (27.3%)	4 (33.3%)	0.752
Tumor size	3.2±2.4	3.0±1.8	0.221
Tumor on HD (days) (n=21)	1804.3±1204.3	2067.4±1658.1	0.290
HD vs. Tx time + HD (days) (n=21), median (IQR)	1962.0 (2095)	3402 (3539)	0.020
RCC type			0.480
Clear-cell	7 (58.3%)	5 (41.7%)	
Cystic	1 (8.3%)	3 (25%)	
Chromophobe	1 (8.3%)	0 (0%)	
Papillary	3 (25.0%)	4 (33.3%)	

ACKD: acquired cystic kidney disease; IQR: interquartile range; RCC: renal cell carcinoma.

USTRS 2020-10

Indications of delayed intensive care unit (ICU) admissions and analysis of ICU-related mortality after adult solitary kidney transplantation

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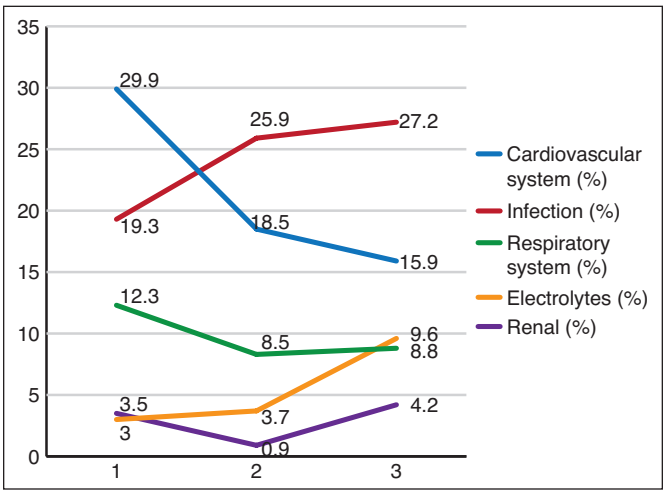
Introduction: Kidney transplant recipients require long-term immunosuppression that has significant metabolic, as well as immune-related side effects. The requirement of high acuity care in this patient population at various time points after kidney transplantation has not been studied.

In the current study, we aimed to assess the reasons for delayed (>30 days) intensive care unit (ICU) admissions after transplant and causes of ICU-related mortality.
Methods: This is a retrospective study of a cohort of adult solitary kidney transplant patients from January 1, 2007 to December 31, 2016 who required ICU admission after 30 days of transplantation. ICU readmissions within 24 hours during the same hospitalization were excluded. The admissions were divided into three groups based on the interval between transplantation and ICU admission: Group 1 from 30 days to six months; Group 2 from six months to two years; and Group 3 after two years. All admissions were categorized according to the primary organ system involved.
Results: Of the 1527 adult solitary kidney transplant recipients in the study period, 285 (Group 1: 50, Group 2: 89, Group 3: 146) required 404 ICU admissions (Group 1: 57, Group 2: 108, Group 3: 239 admissions). Overall, cardiovascular system-related admissions (29.9%, 18.5%, 15.9%), infections (19.3%, 25.9%, 27.2%), and respiratory-related admissions (12.3%, 8.3%, 8.8%) were main causes in all three groups (Fig. 1). A total of 24 (8.4%) patients died in the ICU. Most of the deaths occurred in males (79.2%), Group 3 (54.4%), infections-related admissions (45.8%), and individuals with functioning allograft (66.7%). Infections (45.8%) followed by respiratory system (20.8%) and cardiovascular system (16.7%) were the main causes of ICU-related mortality. Median time from transplantation to death was 2.3 years (interquartile range 1.2–4.6).
Conclusion: Kidney transplant patients continue to be at risk of requiring high-acuity care long after transplantation. Most of these admissions are related to cardiopulmonary system involvement or infections, with cardiopulmonary disorders predominating during the first six months and infections predominating after the first two years. Overall, infections were the leading cause of ICU-related mortality.
Funding: *Critical Care Research Grant, 2018, Mayo Clinic, Rochester.*



USTRS 2020-10. Fig. 1. Trend of causes of intensive care unit admissions in Groups 1, 2, and 3

USTRS 2020-11

The impact of quadriceps muscle layer thickness on length of stay after kidney and kidney-pancreas transplant: A prospective, observational, cohort study

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Introduction: Frailty is emerging as an important prognosticator of outcomes in kidney transplantation, including length of stay (LOS) and rejection. Frailty is a syndrome with significant overlap with sarcopenia, or progressive loss of muscle mass. Quadriceps muscle layer thickness (QMLT) is a novel means of screening for changes in muscle mass. We aimed to assess the predictive value of QMLT on early renal transplant outcomes.
Methods: A prospective, observational, cohort study was performed at our institution from February 2019 to January 2020. All kidney (KTx) and kidney-pancreas (KP) recipients over 18 years were invited to participate. Upon enrollment, patients were assessed for demographic information, frailty score (physical frailty phenotype), and QMLT. QMLT involves point-of-care ultrasound assessment of the anterior thigh musculature, measuring thickness of the rectus femoris and vastus intermedius muscles. Patients were then followed prospectively with the primary outcome of LOS, and secondary outcomes of infection, rejection in the 30-day postoperative period, and 30-day creatinine (Cr) level. The twentieth percentile of QMLT was used to define two groups: low QMLT (L-QMLT) and higher QMLT (H-QMLT). T-test and Mann-Whitney U test were used for continuous variables where appropriate, and Chi-squared/Fisher exact used for categorical variables; alpha was set at 0.05.
Results: Eighty-five patients were enrolled, with 79 having complete data for analysis (73 KTx, 6 KP). Fourteen patients comprised the L-QMLT group (12 KTx/2 KP) with mean QMLT 2.07 cm; H-QMLT (61 KTx/4 KP) had a mean QMLT 4.04 cm. Mean age did not differ between L- and H-QMLT groups (53 vs. 49 years; p=0.40), nor did gender distribution (79% vs. 62% male; p=0.36). H-QMLT had significantly more living donors than L-QMLT (40% vs. 7%; p=0.05). L-QMLT had a 14% rate of frailty, while in H-QMLT 18% were frail (p=0.70). LOS was longer in the L-QMLT group (12 vs. 8 days; p=0.04), and significantly more patients had a LOS >14 days (21% vs. 3%; p=0.04). There was no difference in the rates of infection or rejection in the 30-day postoperative period, and 30-day Cr was similar between groups (153 vs. 135 µmol/L; p=0.18).
Conclusions: Lower QMLT in our cohort of KTx/KP recipients was associated with longer LOS after transplant. Lower QMLT may not accurately predict frailty, per se, but may represent a useful tool in prognostication of outcomes. Further study in relation to formal measurements of sarcopenia, as well as changes in QMLT after transplant are warranted.
Funding*: This project was supported by a CIHR Graduate Student Scholarships.*

USTRS 2020-12

Efficacy of donation awareness campaigns according to a Google trends analysis

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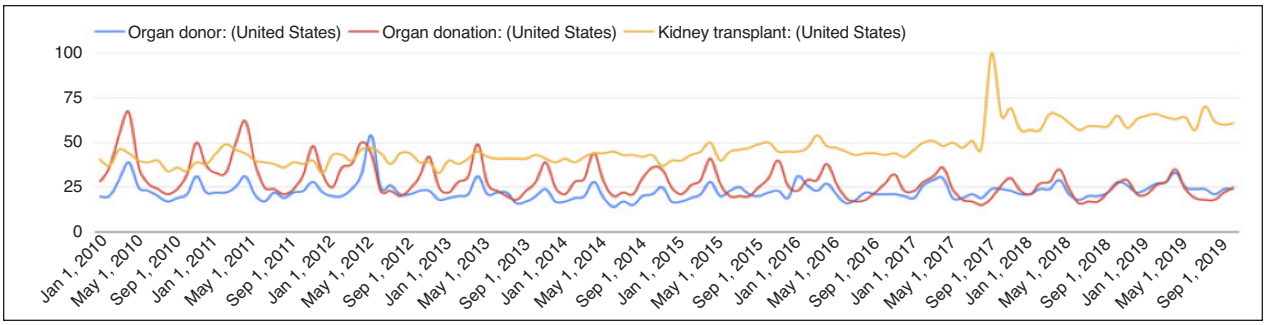
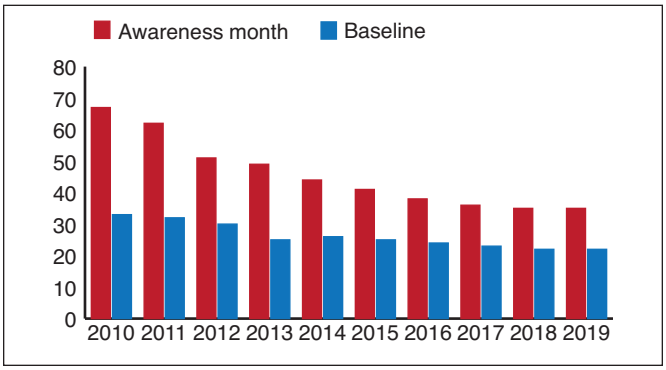
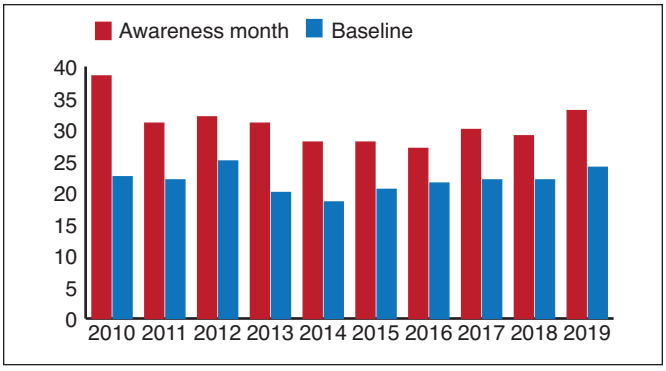
Introduction: Organ transplantation is the optimal treatment for several end-organ-specific diseases. National Donate Life Month (NDLM) occurs annually in April and is a large-scale campaign intended to increase organ donation, education, and participation. We sought to evaluate the public interest response to NDLM by assessing temporal trends of Google search volumes related to organ donation.
Methods: Google trends was used to determine the three most commonly searched terms from 15 colloquial phrases related to organ transplantation from 2010–2019. These terms included "Kidney Transplant," "Organ Donation," and "Organ Donor." Searches were performed in the Seattle, Washington area. We calculated baseline relative search volume (RSV) from 2010–2019 using mean RSV throughout the year excluding March, April, and May. Awareness month RSV was calculated as mean RSV in April. The primary outcome was a significant difference between the awareness months RSV as compared to baseline RSV.
Results: Mean baseline RSVs from 2010–2019 were 47.35, 26.38, and 21.71 for the search terms "Kidney Transplant," "Organ Donation," and "Organ Donor," respectively. Percent increase for search terms during awareness month were: "Kidney Transplant" 4.96% (p=0.55), "Organ Donation" 73.24% (p<0.0001), and "Organ Donor" 41.80% (p<0.0001).
Conclusions: Our study demonstrates an increase in public interest in organ donation as measured change in RSV during NDLM. Interestingly,



USTRS 2020-12. Fig. 1. Donation search index.



USTRS 2020-12. Fig. 2. Organ donation RSV.



USTRS 2020-12. Fig. 3. Organ donor RSV.

this did not apply specifically to kidney transplantation. Additional studies are needed to determine if increased public awareness translates into increased rates of donation.

USTRS 2020-13

Stent colic in renal transplant patients

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Introduction: Ureteric stents are commonly placed following renal transplantation, as they have been shown to decrease urologic complications, including anastomotic stricture and urine leak. It is believed that these stents result in minimal bothersome symptoms due to denervation of the transplant kidney and the location of the uretero-vesical anastomosis at the bladder dome, rather than the trigone and bladder neck. Our objective was to use a validated questionnaire to evaluate symptoms associated with ureteric stents in renal transplant recipients compared with non-transplant stented patients.

Methods: All patients undergoing stent removal at our tertiary care center completed a validated Ureteral Stent Symptom Questionnaire to evaluate symptoms related to the presence of a stent. Categorical results were obtained for urinary symptoms, pain, general health, sexual function, and quality of life, and scores were compared between the two groups.

Results: Twenty-three (nine women and 14 men) patients (mean age 59 years) underwent renal transplant. Twenty-nine (14 women and 13 men) patients (mean age 56 years) had ureteral stents placed for other reasons. Stents remained in place longer in transplant patients (p=0.0005). Transplant patients had fewer urinary symptoms than the control group, with statistically lower rates of incomplete emptying (p=0.01), dysuria (p=0.0007), gross hematuria (p=0.001), overall problem with urinary symptoms (p=0.001), and higher long-term acceptance of the stent (p=0.001). Patients in the transplant group also experienced statistically significantly fewer symptoms of pain with urinating (p=0.02) and need for medications to control pain (p=0.001). Use of alpha blockers was statistically higher in the control group than transplant group (p=0.03). Less than 1% of transplant patients felt that they might be having a urinary tract infection (UTI) compared to 50% of controls (p=0.002) Use of antibiotics for treatment of UTI was only reported in the control group (14%). No transplant patients reported pain with sexual intercourse, compared to 38% of control patients (p=0.2).

Conclusions: Ureteric stents in renal transplant patients are associated with less urinary symptoms, pain, and use of antibiotics and analgesics compared to patients with stenting of the native ureter. Perceived bother of symptoms in renal transplant patients was significantly lower and was associated with better acceptance for being re-stented or keeping the current stent. These are despite the longer duration of being stented and less use of alpha blockers.

USTRS 2020-14

Does antibiotic prophylaxis at ureteral stent removal reduce urinary tract infections in kidney transplant recipients?

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Introduction: Ureteral stents are commonly placed during kidney transplantation (KT). Urinary tract infections (UTI) are a common infectious complication following KT and can have detrimental effects on graft outcomes. Current guidelines do not make recommendations regarding the use of antibiotic (abx) prophylaxis at the time of ureteral stent removal (SR). We aimed to study antibiotic prophylaxis practice at the time of SR, rate of UTI after removal and predictors of UTI.

Methods: We performed a single-center, retrospective review of adult (>18 years) KT recipients who underwent ureteral stent placement at the time of KT between January 2018 and September 2019. Patients receiving simultaneous organ transplantation or being treated for UTI at time

USTRS 2020-14. Table 1. Characteristics of kidney transplant recipients

	Antibiotic prophylaxis prior to stent removal		
Variables	**Yes n=78**	**No n=187**	**p**
Recipient			
Age, years (SD)	54.2 (10.9)	53.9 (13.8)	0.70
Female, n (%)	30 (38.5)	71 (37.9)	0.89
Caucasian, n (%)	40 (51.3)	107 (57.2)	0.42
Cause of ESRD, n (%)			
DM	21 (26.9)	44 (23.5)	0.64
HTN	19 (24.4)	43 (23.0)	0.87
Other	38 (48.7)	100 (53.5)	0.50
Re-transplant, n (%)	10 (12.8)	16 (8.6)	0.36
Induction agent, n (%)			
Thymoglobulin	50 (64.1)	116 (62.0)	0.78
Simulect	24 (30.8)	65 (34.8)	0.57
Other*	2 (2.6)	4 (2.1)	1.00
Urinary tract abnormalities, n (%)	13 (16.7)	28 (15.0)	0.71
Discharged with SMP/TMX, n (%)	67 (85.9)	175 (93.6)	0.055
Duration of foley catheter, days (SD)	8.3 (5.1)	7.3 (3.6)	0.28
Duration of stent, days (SD)	31.6 (10.1)	31.3 (9.6)	0.92
Interval UTI between KT and stent removal, n (%)	15 (19.2)	2 (1.1)	0.0006
Setting of stent removal, n (%)			<0.0001
Outpatient procedure	51 (65.3)	174 (93.0)	
Operating room	27 (34.6)	6 (3.2)	
UTI within 4 weeks of stent removal, n (%)	6 (7.7)	7 (3.7)	0.21
Donor			
Deceased, n (%)	56 (71.8)	109 (58.3)	0.051
Age, years (SD)	42.2 (12.1)	40.1 (14.6)	0.34
Female, n (%)	39 (50.0)	84 (44.9)	0.50

*Missing data (n=4). DM: diabetes mellitus; ESRD: end-stage renal disease; HTN: hypertension; KT: kidney transplant; SD: standard deviation; SMP/TMX: trimethoprim/sulfamethoxazole; UTI: urinary tract infection.

of stent removal were excluded. Baseline demographic, urinalysis, and urine culture data before and one month after SR were analyzed. UTI was defined as a positive urine culture with $>10^5$ colony-forming units or documented sepsis with concordant urine and blood culture pathogens. Mann-Whitney (continuous variables) and Fisher's exact (categorical variables) tests were used. Logistic regression for independent risk factors of UTI within four weeks of SR was performed.
Results: A total of 78 of 265 (29%) patients received abx at time of SR (+AB). These patients had more SR in the operating room during simultaneous peritoneal dialysis catheter removal (Table 1). All other perioperative variables between the +AB and -AB groups were similar. There was no difference in incidence of post-SR UTI in the +AB group (p=0.21). Urine cultures prior to SR were sent more often in patients with longer duration of indwelling catheter (9.2 vs. 7.2 days; p=0.04). Longer hospital stay (odds ratio [OR] 1.24 [1.05–1.46]; p=0.01) increased UTI rate (Table 2). UTI between KT and SR had an OR 4.72 (0.99-22.4; p=0.05).
Conclusions: Additional abx prophylaxis at the time of SR does not appear to reduce the incidence of UTI. Prophylaxis may be beneficial for recipients who had an interval UTI following KT prior to SR.

USTRS 2020-15

Active surveillance for prostate cancer in patients being activated for renal transplantation

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Introduction: Current organ transplant guidelines suggest active treatment and specific waiting times following diagnosis of invasive cancer. Due to the indolent nature of low-risk prostate cancer (CaP), active surveillance (AS) is an accepted and recommended strategy in non-renal transplantation (RT) patients. This strategy may be appropriate for selected men with CaP being condisered for RT. We assessed the safety and feasibility of AS in patients being considered for RT.
Methods: Men with renal failure being considered for RT have a baseline prostate-specific antigen (PSA) test as part of transplant assessment. A regional transplant center database was assessed for the number of men with a new diagnosis of CaP prior to RT between 2009 and 2019. Those men with low-risk CaP (Gleason 3+3), PSA ≤10 ng/ml, ≤T2 on multiparametric magnetic resonance imaging (mpMRI) were considered for AS, brachytherapy, and robot-assisted radical prostatectomy (RARP). Exceptionally, men with low-volume Gleason 3+4 were also considered for AS. Our AS protocol consisted of three monthly PSA checks with interval mpMRI ± interval transperineal prostate biopsy (TPB) every 12–18 months. Patients on AS could be activated for RT.
Results: A total of 33 men (mean age 63 years) were identified with a new diagnosis of CaP as part of workup toward RT. Twelve of 33 men with CaP (3 pT1a; 9 pT2) had AS management (mean PSA 6.4 ng/ml; range 2–15), of whom 9/12 had GS3+3 and three had low-volume Gleason 3+4. Mean followup time was 42 months (range 6–96): six men had received a RT (mean time from CaP diagnosis to transplant was 40 months [range 12–101]). The mean estimated glomerular filtration rate (eGFR) post-RT was 34 ml/min. One of six RT failed after 100 days; one patient declined transplant and wished to remain on dialysis on AS; two men have been activated on the transplant waiting list (mean time from CaP diagnosis to activation three months) and three men are completing medical aspects of transplant workup. AS consisted of PSA followup; mpMRI in six of 12 men and both mpMRI and TP biopsy in two of 12. Three of 12 patients were awaiting their first AS followup appointment. No patient on AS had progression of CaP on dialysis or post-RT (mean PSA 4.4 ng/ml; range 1.2–10.5).
Conclusions: AS for low-risk CaP appears safe in this small cohort being considered for RT. AS may be underused compared to other treatments. The major advantage of AS is ability to progress to RT in a timely fashion; providing a treatment for renal failure that will most likely optimize quality of life/life expectancy, avoiding treatment morbidities and time delays to RT. We suggest RT can occur with a robust AS protocol. Larger cohorts with longer followup will help assess oncological outcomes and compare mortality to those who had alternate CaP treatments.

USTRS 2020-16

Reducing transplant ureteric stent time with novel stent removal technologies: A four-cycle audit

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Introduction: Ureteric stent insertion has become standard practice during renal transplant surgery, where early removal has been demonstrated to reduce infection rates for transplant patients with a current aim of within 42 days post-transplant. BlackStar magnetic stents and Isiris single-use technology allow portable outpatient stent removal without the need for traditional cystoscopy. We investigated whether removal times could be improved through their use.
Methods: This was a four-cycle audit of stent removal in 407 renal transplant or simultaneous pancreas kidney transplantation (SPK) patients.

USTRS 2020-14. Table 2. Univariate and multivariate analysis of risk factors associated with UTI within 4 weeks of stent removal

		Univariate			Multivariate		
Covariate	**Mean (SD) or n (%) n=13**	**OR**	**95% CI**	**p**	**OR**	**95% CI**	**p**
Recipient							
Age	59.4 (12.1)	1.04	0.98–1.09	0.13	1.05	0.95–1.15	0.35
Female	7 (53.9)	1.92	0.63–5.89	0.25			
Caucasian	7 (53.9)	0.91	0.29–2.78	0.86			
Re-transplant	2 (15.4)	1.70	0.36–8.14	0.50			
Discharge with SMP/TMX	10 (76.9)	0.29	0.07–1.14	0.08	0.71	0.06–8.65	0.79
Abnormal urinary tract	3 (23.1)	1.67	0.44–6.33	0.45			
Length of stay	5.3 (3.9)	1.24	1.05–1.46	0.01	1.11	0.86–1.42	0.43
Antibiotic at stent removal	6 (46.2)	2.12	0.69–6.52	0.19	0.46	0.04–5.75	0.54
Time to stent removal	32.2 (16.7)	1.01	0.96–1.06	0.77			
Duration of foley	9.5 (5.9)	1.08	0.98–1.19	0.11	0.93	0.79–1.11	0.45
Removal: Outpatient procedure	12 (92.3)	1.82	0.34–33.7	0.54			
Interval UTI	6 (46.2)	4.72	0.99–22.4	0.05	6.70	0.58–77.8	0.12
Donor							
Deceased	9 (69.2)	1.46	0.41–4.55	0.61			
Age	46.2 (14.7)	1.03	0.98–1.07	0.14			
Female	5 (38.5)	0.81	0.24–2.61	0.19	0.34	0.05–2.32	0.27

CI: confidence interval; OR: odds ratio; SD: standard deviation; SMP/TMX: trimethoprim/sulfamethoxazole; UTI: urinary tract infection

Magnetic stents were limited to female renal transplants only. Removal of stent at transplant nephrectomy, spontaneously or patient mortality with stent in situ was excluded from the study. If long-term stent was required for stenosis in a comorbid patient, this was also excluded.

Results: In cycle one, 80/183 removals were by outpatient flexible cystoscopy; mean time to removal was 47 days. Forty-six of 183 removals were with Isiris single-use; mean time to removal was 43 days. Three of 46 (7%) Isiris cases required an additional cystoscopy to remove the stent. Seventeen of 183 removals used BlackStar magnetic stent (31% of eligible patients); mean time to removal was 29.5 days. Eleven of 183 patients had removal in theatres under general anesthesia/sedation using different modalities; mean time to removal was 48 days. After cycle one, Isiris and magnetic technologies were prioritized, with only one patient having standard outpatient flexible cystoscopy removal. The mean stent time for Isiris cases was reduced to 35 days (cycle 2), 29 days (cycle 3), and 31 days (cycle 4). The mean stent time for magnetic stents was reduced to 24 days (cycle 2), 21 days (cycle 3), and 21 days (cycle 4).

Conclusions: Isiris and BlackStar magnetic stent removal technologies allowed reduction in time from transplant to stent removal. Blackstar magnetic stent removal achieved our new target of 21 days post-transplant for stent removal but was only used in female patients. Isiris permitted earlier removal than with cystoscopy but, as yet, we haven't reached the new target of 21 days. Both stent removal devices can be used in any clinical environment and has become a nurse-led procedure in our department. Both Isiris and BlackStar permit stent removal at concurrent outpatient clinics, reducing the total number of hospital visits, healthcare costs, and burden to our patients.

USTRS 2020-16. Table 1

Cycle	No. patients	No. patients excluded
1	182	5
2	105	0
3	62	0
4	58	2

USTRS 2020-17

Reduction in physician burnout among transplant surgeons: A preliminary result of the role of medical missions

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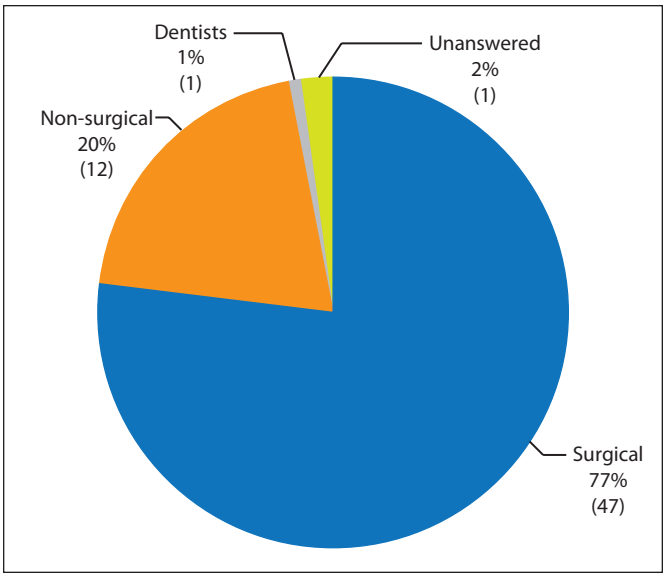
Introduction: In April 2019, the World Health Organization (WHO) updated the definition of "burnout," designating the so-called "stress syndrome" as a medical diagnosis. According to the International Classification of Diseases (ICD) diagnostic manual, burnout is a "syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed." Physician burnout results in feelings of exhaustion, reduced professional productivity, and negative feelings toward a career in medicine. The objective of this preliminary study was to report prevalence of burnout among transplant surgeons who participated in medical missions in a cross-sectional survey and to assess the effect participation has on burnout in this cohort.

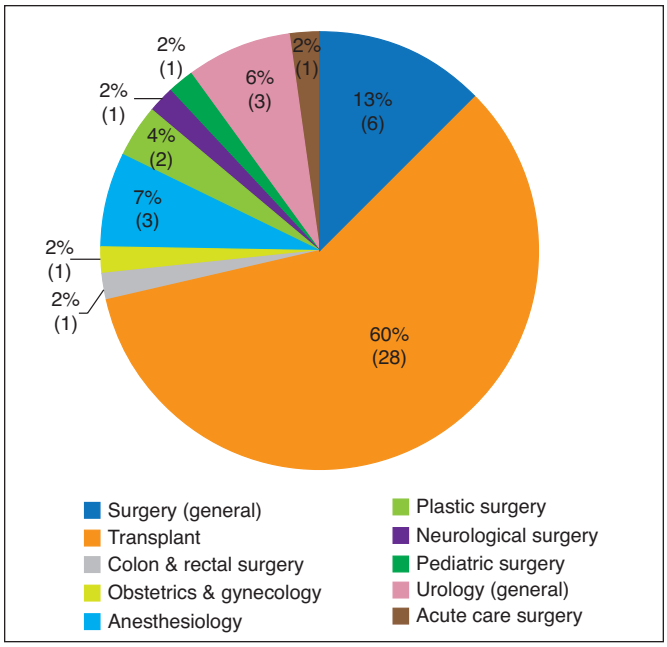
Methods: A 27-question survey was administered by Qualtrics: 28 transplant surgeons with prior participation in medical missions submitted answers to questions about medical specialty, exhaustion, productivity, general feelings of burnout, involvement in medical missions, and feelings of burnout before and after a medical mission.

Results: One of 28 reported total satisfaction with their work with no symptoms of burnout prior to a medical mission, while five of 28 reported total satisfaction with their work after medical missions. Overall, 43% of transplant physicians reported burnout before participating in medical missions, while 32% of transplant physicians reported burnout after medical missions.

Conclusions: Participation in medical missions has the potential to decrease physician burnout and increase job satisfaction among transplant surgeons. Further research is needed to explore the potential benefits of medical missions on participating surgeons and the host communities.



USTRS 2020-17. Fig. 1. Specialties represented.



USTRS 2020-17. Fig. 2. Further breakdown of surgical specialty responders.

USTRS 2020-18

Perioperative pregabalin in kidney stone surgery: A pilot

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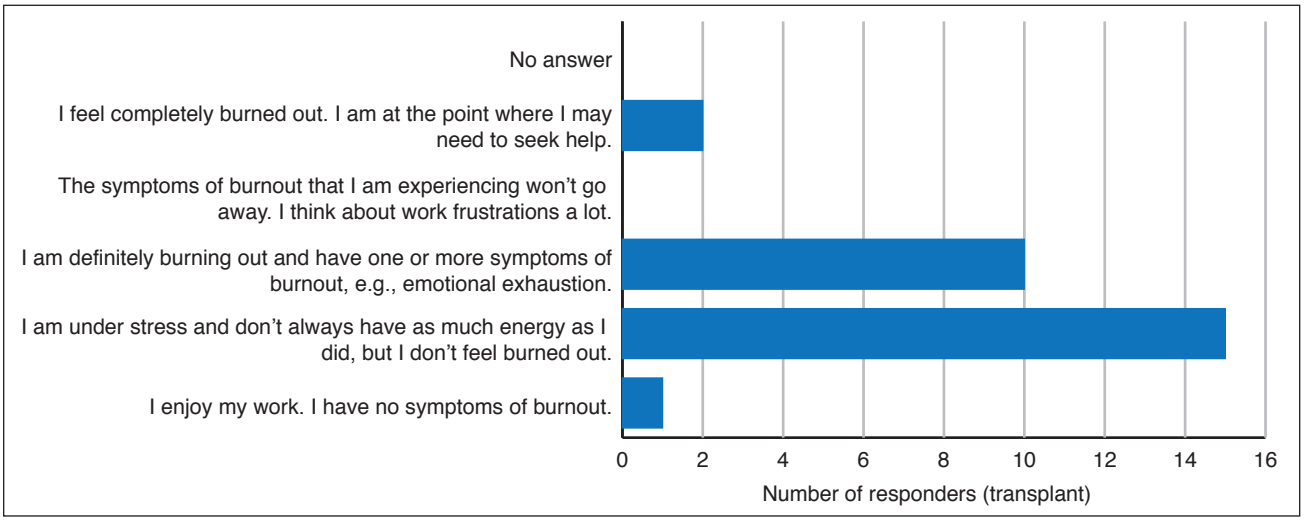
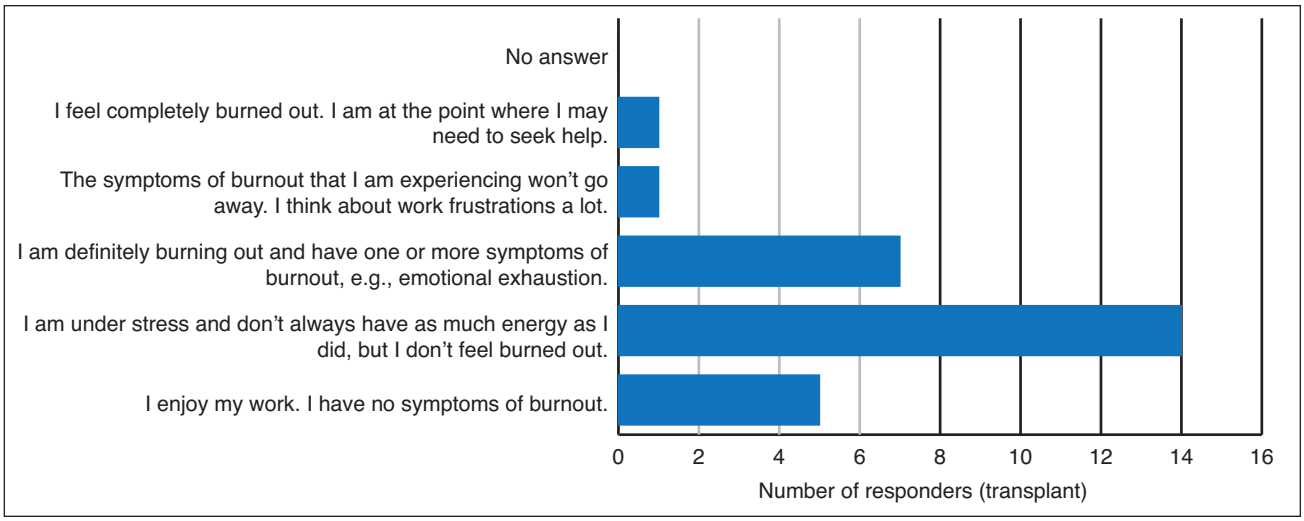
Introduction: Opioid misuse is a major concern across the world. Recent evidence shows that ureteroscopy (URS) is associated with a 6% risk of new persistent opioid use. Perioperative pregabalin has previously been shown to have opioid-sparing effects in both urological and non-urological surgery. We hypothesized that perioperative pregabalin would be beneficial for patients undergoing kidney stone surgery and conducted retrospective analyses and a pilot prospective trial in preparation for an upcoming randomized, controlled trial.

Methods: With IRB exemption (#2012823), we retrospectively examined opioid use and outcomes after kidney stone surgery at our institution. After IRB approval (#2015185, clinicaltrials.gov #NCT03927781), we performed a prospective pilot study of perioperative pregabalin at kidney stone surgery in 10 patients with renal function allowing non-steroidal anti-inflammatory drug use and no history of gabapentinoid or opioid allergy or abuse. One hour preoperatively, 300 mg of pregabalin was administered. Anesthesia and surgery proceeded without restrictions. Ketorolac, ondansetron, and a belladonna and opium suppository were administered at the conclusion of surgery. Diclofenac and mirabegron were provided at discharge. Patients undertook several surveys, and we performed a chart review 30 days post-surgery.

Results: Most (86%) of the 45 patients in our retrospective cohort were prescribed narcotics at discharge; 27% had an emergency department visit or hospitalization within the first 30 postoperative days. The pilot enrolled 10 patients, of whom 30% expected to need opioid pain medication. All 10 patients received intraoperative opioids and seven received



USTRS 2020-17. Fig. 3. Results of survey question: Using your own definition of "burnout," please click one of the answers below to characterize your feelings before going on a mission.



USTRS 2020-17. Fig. 4. Results of survey question: Using your own definition of "burnout," please click one of the answers below to characterize your feelings after going on a mission.

post-anesthesia care unit narcotic. No patient was prescribed opioid at discharge. One patient was found to have opioid prescription within the first 30 postoperative days. She also had emergency room visits (three, in fact) and a brief inpatient hospital stay. She was prescribed the equivalent of 90 mg oxycodone.

Conclusions: Kidney stone surgery is very common with a known risk of new persistent opioid use. Retrospective analysis a very high rate of baseline narcotic prescribing after URS. In the prospective pilot, we showed that this may represent overprescribing. The historical absolute effect size of perioperative pregabalin on opioid use is small. In a common procedure, like kidney stone surgery, this may have a great population-level effect. We provide beginning evidence that, for most patients, discharge narcotics after URS are not needed. We also show feasibility of studying pregabalin-based, opioid-sparing techniques.

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