Moderated Posters 6: ED, Infertility and Transplantation
June 25, 2013, 1400-1600

MP-06.01
Measurement of Endothelial Dysfunction via Peripheral Arterial Tonometry (PAT) Predicts Vasculogenic Erectile Dysfunction (ED)

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Introduction: ED is associated with arterial insufficiency & endothelial dysfunction. Identified using penile duplex ultrasonography, it is an early manifestation of systemic vascular disease. PAT is an independent predictor of cardiac death & myocardial infarction; however, the roles of endothelial dysfunction in evaluation of men with ED have not yet been established.

Methods: A total of 139 men were assessed for ED using penile duplex ultrasonography, laboratory investigations, & PAT. ED was defined as a peak systolic velocity (PSV) of ≤25 cm/s (in either cavernosal artery) at 5 minutes following injection of a vasodilating agent. The reactive hyperemia index (RHI), a measurement of endothelial dysfunction in medium/small arteries, was recorded via PAT (RHI <2 endothelial dysfunction; >2 normal). Augmentation index (AI), a measure of medium/large arterial wall elasticity, was also noted.

Results: Penile duplex ultrasound divided men into two groups: those with ED (n=109) & those without (n=30). Men with ED had a PSV of 22±12 cm/s (left cavernous artery) and 21±8 cm/s (right). Men without ED had values of 39±14 cm/s (left) & 39±12 (right). Men with ED (mean age=53±14 yrs) were younger than those without ED (47±18 yrs) however BMIs were similar (ED=29±5 kg/m2; no ED=28±5 kg/m2). No differences testosterone, estradiol, & IGF were observed. Given the potential for altered endothelial function in diabetes, we confirmed hemoglobin A1c was not different between the groups. On assessment of PAT, those with ED had an RHI of 1.9±0.6 while those without ED had a significantly increased RHI of 2.2±1. Patients on PDE5 inhibitors were analyzed separately & no differences in RHI were noted. No differences were observed in the AI scores.

Conclusions: Measurement of endothelial function with PAT differentiates men with ED from those without. These findings suggest that PAT-derived RHI could be used as a non-invasive surrogate for penile duplex ultrasound in assessment of ED.

MP-06.02
A Bio-psychosocial Sexual Rehabilitation Clinic for Couples Following Radical Prostatectomy

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Introduction and Objectives: As prostate cancer (PC) incidence continues to rise, the pool of survivors grows. Men receiving PC treatment suffer sexual dysfunction (SD) and related distress. Partners may experience greater distress than patients. This distress extends beyond erectile function and involves intimacy loss, low self-esteem, guilt, depression, and anxiety. Reported interventions have not been successful in reducing the impact of SD on long-term quality of life. In addressing the need for effective SD interventions we developed the Prostate Cancer Rehabilitation Clinic (PCRC), a Bio-psychosocial Sexual Rehabilitation Program emphasizing: (1) multidisciplinary teams; (2) partner participation; and (3) a medical, psychological, and social approach. The current study describes PCRC interest and participation, including partner involvement. Reasons for patient non-participation are explored.

Methods: A chart review was performed on the PCRC quality of care database for patients undergoing a radical prostatectomy (RP) between Jan. 2012 and Dec. 2012. Descriptive statistics were used to summarize the data.

Results: 335 RPs were conducted at the Princess Margaret Cancer Centre in 2012. 221 (66%) patients were interested in the PCRC; 111 (33%) declined. Decliners were not sexually active (n=73; 66%) or lived too far to travel to the clinic (n=18; 16%). Of the interested patients, 184 (83%) attended appointments in 2012, and 23 (13%) have initial PCRC visits in 2013. Attendees included 114 (62%) couples, 34 (19%) patients without their partners; 7 (4%) single patients, and 5 (3%) patients with an unknown partner status.

Conclusions: Interest in participating in a sexual rehabilitation clinic is high among post-RP patients. Most patients expressing interest do participate in the program. The finding that the majority of patients in romantic relationships attend with their partners suggests that sexual rehabilitation programming should be designed to support couples.

MP-06.03
Uroflow StopTest Following Robotic-assisted Radical Prostatectomy Can Predict Integrity of Pelvic Floor and Return of Erectile Function

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Introduction and Objectives: We recently showed the role of voluntary stop of urine flow during voiding in uroflowmeter at time of catheter removal after RARP, in the prediction of early return of urine continence and pelvic floor integrity. Recovery of urine continence and erectile function seem to interplay as it was shown that nerve sparing during RARP can improve the rates of urine continence after surgery. Hence, the objective of this study is to examine the predictive role of positive uroflowmetery StopTest on erectile function recovery following RARP.

Materials and Methods: In this prospective study, 108 patients with a minimum of 2 year follow-up, operated by a single surgeon (AEH) were subjected to an uroflowmetry at the time of urethral catheter removal following RARP. 44 patients met our inclusion criteria of preoperative SHIM ≥21. Two groups were studied, group one with positive Stop Test (n=30) and group two with negative Stop Test (n=14). A positive StopTest is defined as the ability to stop urine flow voluntarily for more than 3 seconds provided that a maximum flow of at least 15 ml/sec was reached. Urine continence was defined as 0-pads usage and potency defined as penetration during intercourse.

Results: Age, BMI, IPSS score, PSA, tumour stage, prostate volume, nerve sparing status and estimated blood loss were not statistically different between the two groups. The mean interval to return of urine continence in group one was 2.2 months (range 1-9 months), compared to 13.7 months (range 1-48 months) in group 2 (p=0.0001). On the other hand, the mean interval to return of potency in group one was 3.9 months (range 1-12 months), compared to 10.7 months (range 1-24 months) in group 2 (p=0003).

Conclusions: Novel use of uroflowmetry at time of urethral catheter removal is simple, non-invasive and good indicator of pelvic floor integrity with the ability to predict early recovery of potency and urine continence following RARP.

MP-06.04

Vasectomy Reversal in Men with a Long Obstructive Interval: Is There a Role for Preoperative Testicular Biopsy?

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Introduction and Objectives: To determine the clinical utility of preoperative testicular biopsy in men contemplating vasectomy reversal when a long obstructive interval (OI) is present.

Methods: A retrospective chart review identified patients undergoing testicular biopsy prior to considering vasectomy reversal from 2000-2010 at The Ottawa Hospital. Patients were included only if the primary indication for biopsy was a long OI since vasectomy. Testicular histology was assessed and compared to the OI. Patency rates were determined for patients who underwent vasectomy reversal.

Results: 39 patients were included. Median OI was 12 years (Range 6-25 years). Testicular biopsy showed normal spermatogenesis in 37 (95%), and hypospermatogenesis in 2 (5%). 22 patients (56%) underwent vasectomy reversal, including both patients with hypospermatogenesis on biopsy. The median OI in the groups undergoing reversal vs. no reversal was 11 and 14 years respectively (p=0.02). 20 of 22 patients had postoperative semen analysis data. Overall patency rate was 61%, and was 43%, 71%, and 75% for OI of <9 years, 10-14 years, and >14 years respectively. Of the patients with hypospermatogenesis, one was lost to follow-up and the other could not undergo reconstruction due to extensive vassal occlusion. 4 of 7 patients biopsied with OI <10 years were biopsied for previous failed reversal. When patients with a previous failed reversal were excluded, the overall patency rate was 77%.

Conclusion: In this series of 39 men with a long OI since vasectomy, testicular biopsy demonstrated normal histology in the majority of cases, and the presence of at least some sperm in all cases. Therefore, based on our findings, testicular biopsy is not predictive of successful vasectomy reversal in men with a long OI and should not be part of routine preoperative assessment. However, testicular biopsy prior to vasectomy reversal in men who are at higher risk of primary testicular failure should still be considered.

MP-06.05

Ten Year Review of Vasectomy Pathology: Strengthening the Case Against Routine Histological Evaluation

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Introduction and Objectives: The AUA concludes that routine histologic confirmation is unnecessary in performing vasectomy because azoospermia after a bilateral vasectomy is the standard for success. Despite this clear direction, many centres continue to send all routine vasectomy specimens for pathological evaluation. This study evaluates a 10-year cohort of routine histological vasectomy specimens for rates of "failed" vasectomy, cost analysis, and dangerous pathology.

Methods: A retrospective review of a single pathology lab's database from 1999 to 2009 was completed.

Results: A total of 3883 procedures were completed with 7766 individual specimens submitted. Only 17 cases were reported as absence of vas deferens in specimen or 0.44% (95% CI: 0.26% to 0.70%). 82% of abnormal specimens were determined to be vascular or nerve tissue, with the remainder being adipose or fibrous tissue. Of the 17 abnormal cases, 12 (71%) completed postoperative semen analysis and 2 patients directly repeated the procedure with success. Of the pathological "failures" only 58.3% (95% CI: 27.7% to 84.8%) were actual vasectomy failures by semen analysis, i.e 42% showed absence of sperm in the hanging drop despite having no vas in the specimen. In our data, the probability of failed vasectomy was 0.0026. That is, 1 failed vasectomy could be expected in every 385 procedures. Estimated cost of histologic analysis per specimen at our centre was $72.50. The average cost per year on routine vasectomy pathology was $28,152. No malignancy, hyperplasia or suspicious histology was reported in all specimens.

Conclusions: The likelihood of dangerous pathology in vasectomy is essentially nil. Considering the cost of histological examination, the rarity of excising structures other than the vas deferens, and the high probability that even with abnormal histology the patient will be azoospermic, physicians should consider only sending difficult cases for histologic analysis.

MP-06.06

Salvaging Severely Damaged Renal Allografts with Synthetic Mesh Renorrhaphy and Neocapsule Reconstruction

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Introduction and Objectives: In an effort to expand the donor pool organs are now being utilized from unconventional donors. Historically injured renal allografts are usually discarded and not considered fit for transplantation due to concerns for postoperative hemorrhage, urinoma and non function leading to allograft loss. In transplant literature there is no information available about salvagability, technique of repair, complications and outcomes of such organs. We present our technique, postoperative imaging and long term outcome in cases where damaged renal allografts that were salvaged and transplanted using woven Polyglactin mesh.

Methods: In this technique, off-the-shelf 12×12 inch Polyglactin woven mesh was used in vest-over-pants manner with keyhole hilar exit and slit for ureteral sparing to salvage allografts that had been damaged due to donor or recipient factors. The two tails of above fashioned mesh then were wrapped at the convex border of the allograft, closed with a running suture. The technique was used in the following scenarios: i) Allograft with severe unidentified capsular damage from repeated Extracoporeal Shock Wave lithotripsies for stone disease in the donor, that ruptured at the time of post-transplant reperfusion ii) Allograft with unrecognized grade 3 traumatic laceration and calyceal injury, identified due to expanding hematoma post-perfusion iii) Thrombophilic pediatric patient on anticoagulation with allograft damage and total capsular denudation due to iatrogenic needle laceration. These patients underwent successful transplantation, requiring no adjustment to their immunosuppression, monitored for Page Kidney, hydronephrosis.

Results: Using this technique, allografts were salvaged. No patient developed Page kidney, hydronephrosis or hemorrhage.

Conclusions: This easy to perform technique, with readily available materials can salvage allografts that would have been potentially discarded.

MP-06.07

Incidence of Thrombophilia in Autoimmune Versus Anatomic Causes of Pediatric End Stage Renal Disease (ESRD) Patients

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Introduction: In the pediatric renal transplant population, thrombophilic states can lead to vascular complications. Literature for pre-transplant thrombophilia incidence in this population is sparse with no data examining the thrombophilia incidence across ESRD etiologies. Our study aims to compare thrombophilia incidence between anatomic (group A) and autoimmune (non-anatomic group NA) ESRD categories and to examine outcomes. Our hypothesis is that thrombophilia will be more prevalent in NA patients with worse graft outcomes.

Methods: A retrospective analysis was done on patients referred for transplantation. Since 2005 thrombophilia screening was performed on all referred ESRD patients. Anatomic group (A) was defined as congenital dysplastic, reflux nephropathy, valve or exstrophy bladder as ESRD cause, compared to patients with autoimmune etiologies, glomerulonephritidis, and atypical HUS (NA). Patients were managed postoperatively with anticoagulation according to coagulation risk profile. The incidences, thrombophilia types, and graft outcomes were compared.

Results: 63 patients were analyzed. 22/63 patients had one or more thrombophilia risk factors. 33 patients were in group A, 23 patients in group NA, and 7 patients had unknown ESRD cause. 12/23 in group NA, 9/33 in group A (p<0.05), and 1/7 in the unknown group had thrombophilia. No difference in outcomes was noticed between groups A and NA or those with and without thrombophilia. The most common thrombophilic defect

in group NA was lupus anticoagulant and MHTFR mutation in group A.
Conclusions: Compared to the general population, there is a higher incidence of undetected thrombophilia in our pediatric ESRD population. This risk is higher in patients with ESRD of NA etiology with a relatively higher prevalence of lupus anticoagulant. By identifying and using postoperative anticoagulation based on pre-transplant thrombophilia screening, there are equivalent transplant outcomes in these two populations.

MP-06.08

Glomerular Filtration Rate Dynamics Following Unilateral Nephrectomy of Live Kidney Donors

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Background: Living donor kidney transplantation is associated with improved allograft function and survival. As its popularity increases, so does the unique population of living kidney donors who require long term follow-up.
Methods: We examined 161 live kidney donors to determine the recovery dynamics of their kidney function using estimated Glomerular Filtration Rate (GFR) from Serum Creatinine and identifed risk factors for delayed or reduced renal recovery after nephrectomy. We compared preoperative GFR determined by renogram, with comprehensive lab results obtained preoperatively, perioperatively and at 3 months, 6 months, 12 months postoperatively and annually thereafter as part of a donor surveillance protocol.
Results: As expected, donor GFRs fall immediately post-nephrectomy, but analysis of recovery up to 2 years post-nephrectomy reveals that patients with higher preoperative GFRs had a greater proportionate fall in total renal function postoperatively and recovered proportionally less long term when compared to patients with lower preoperative GFRs. Risk factors for longer term donor renal impairment GFR (<60 ml/min/1.73m2) include higher BMI, higher preoperative GFR, higher albumin-to-creatinine ratio, and a history of smoking and regular alcohol consumption.
Conclusions: This study highlights the importance of both adequate donor screening prior to nephrectomy and donor surveillance protocols, especially in the setting of increased demand for living donor transplantation.

MP-06.09

Hydrogen Sulfide Treatment Ameliorates Long-term Renal Dysfunction Resulting from Warm Renal Ischemia-Reperfusion Injury

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Introduction and Objectives: The incidence of renal cell carcinoma (RCC) continues to rise concurrently with increased prevalence of end-stage renal disease world-wide. Treatment for RCC is limited and usually involves partial nephrectomy, resulting in warm renal ischemia and reperfusion injury (IRI). Prolonged warm IRI injures residual renal tissue and can lead to premature dialysis. We have recently demonstrated that hydrogen sulfide (H_2S), a novel endogenous gaseous molecule, is protective against prolonged cold and short-term warm renal IRI[1,2]. In the current study, we examined whether exogenous H_2S has long-term protective effects against warm renal IRI associated with renal surgical procedures.
Methods: Uni-nephrectomized Lewis rats underwent 1 hour of warm ischemia and 2 hours of reperfusion during intraperitoneal treatment with phosphate buffered saline (PBS; IRI group) (n=6) or PBS supplemented with 150 μM NaHS (H_2S group) (n=6), and were compared with sham-operated rats (n=4). Serum creatinine (Cr), aspartate aminotransferase (AST), alanine aminotransferase (ALT) levels were analyzed to assess graft function and systemic inflammation. Animals were sacrificed at day 7 and kidneys were obtained for RT-PCR analysis.
Results: H_2S treated animals exhibited significantly decreased serum Cr at day 7 compared to IRI animals ($p<0.05$), though Cr levels in both treatment groups decreased with time. AST and ALT levels were initially elevated in both treatment groups, but subsided to baseline levels at day 3 and remained at baseline at day 7. There were no significant differences in the expression of inflammatory and apoptotic markers TLR4, CCR5, IL8, TNFα, IFNγ, IL2, ICAM1, BCL2, ERK1, ERK2, BID and KIM1.
Conclusions: H_2S treatment improved long-term renal function and decreased inflammation associated with warm IRI, and may offer a novel therapeutic approach to preventing injury associated with warm IRI incurred during renal surgery such as partial nephrectomy.

MP-06.10

The Effect of Pancreas Transplantation on 10-year Cardiovascular Disease Risk in Type 1 Diabetics Undergoing Simultaneous Pancreas Kidney Transplantation

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Introduction and Objectives: It is uncertain whether pancreas transplants in type 1 diabetics requiring kidney transplantations improve overall patient health and survival. The aim of this study was to look at the impact of pancreas transplants on type 1 diabetics using the Framingham Risk Score (FRS) for 10-year cardiovascular disease (CVD) risk.
Methods: Between 2004 and 2012, 51 type 1 diabetics received simultaneous pancreas kidney (SPK) and 18 received solitary kidney (SK) transplants. The two groups were matched in terms of age and donor renal function. The FRS for 10-year CVD risk was calculated and compared between the two groups preoperatively and one-year postoperatively. Individual risk factors were also compared to examine its effect on cardiac risk reduction.
Results: SPK and SK transplant patients received renal grafts that were equivalent in function as indicated by the donor glomerular filtration rate (GFR) (124.8±65.6 vs. 111.4±40.9 mL/min/1.73 m2, $p>0.05$). Using the FRS calculator, we determined that the preoperative risk score for SPK transplant group was 12.5±8.6% compared with 8.9±7.0% one-year postoperatively ($p=0.0007$). There was no significant difference in SK transplant group when comparing the pre- and postoperative CVD risks. One year postoperatively, SPK recipients had reduced their total number of antihypertensive medications ($p=0.0000008$) and statins ($p=0.001$). SPK transplantations also decreased the recipients' triglyceride levels from 1.36±0.81 mmol/L to 0.99±0.37 mmol/L ($p=0.003$). In contrast, SK recipients had no changes in the number of antihypertensive medications or statins, and no difference in triglyceride levels.
Conclusions: Pancreas transplantation has a positive impact on patient health based on the analysis of FRS for 10-year CVD risk. According to FRS, SPK transplantation reduced the CVD risk from intermediate (10-20%) to low (<10%) risk range. Its impact on cardiovascular complications continues to be studied.

MP-06.11

Surgical Anastomosis Time and Early Outcomes in Deceased Donor Kidney Transplantation

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Introduction and Objectives: Most studies on deceased donor kidney transplantation have focused on the impact of cold ischemic time on subsequent graft function and graft survival. Relatively less is known about anastomosis time (AT) and the implications on early transplant outcomes. Our objective was to determine whether longer ATs had negative impacts on delayed graft function, serum creatinine levels, as well as length of stay in hospital.
Methods: This is a retrospective chart review of 298 solitary deceased donor (DD) kidney recipients with recorded ATs from 1/2006 to 8/2012 during their first hospital stay. The outcomes were incidence of delayed graft function (DGF) defined as the need for dialysis, length of stay in

hospital measured in days (DIH), and kidney function measured by serum creatinine in µmol/L at day 7 post-transplant. We defined AT as the time between ending the cooling period and successful renal artery anastomosis of the donor kidney. Dependent outcome variables examined in logistic (DGF) and linear regression models (DIH and day 7 creatinine) were adjusted for recipient age, diabetes status and gender, donor age, HLA, MM, cPRA, CMV donor and recipient status, and cold ischemic time (CIT).

Results: DGF was observed in 56 patients (18.5%). AT (mean 35±15) was independently associated with DGF in the fully adjusted logistic regression analysis (Odds Ratio [OR] 1.037 per minute, 95% CI 1.016, 1.057, p=0.001). An AT >29 minutes was associated with a higher rate of DGF (OR 3.5, 95% CI 1.6, 7.3, p=0.001). Mean days in hospital were 12.4 days. AT (B coefficient 0.20 days per minute AT, p<0.001) was associated with longer stays in hospital. Mean creatinine at day 7 was 257 µmol/L (2.9 mg/dL). AT (B coefficient 4.0 µmol/L per minute AT, p<0.001) was associated with a higher creatinine at day 7. CIT was not a predictor of DIH or kidney function. No long term effects were seen on graft or patient survival, however event rates were low.

Conclusions: An AT >29 min was associated with a 3.5-fold increased risk of DGF. Every 5 minutes of longer AT was associated with 1 extra day in hospital and a serum creatinine 20 µmol/L higher on day 7. AT may be an underappreciated variable in dictating use of hospital resources. Unlike previous DD studies, CIT did not have a significant impact delayed graft function.

MP-06.12

Estimating Differential Renal Function Using Ellipsoid Approximation of Renal Function on Computed Tomography

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Introduction: Living renal donors must undergo extensive medical investigations in order to be approved for the donor program. Among other testing, this includes both computed tomography (CT) scans to evaluate vascular anatomy and nuclear medicine renal scans to assess for differential renal function.

Extensive research has been done using complex models to calculate precise radiographic measurement of renal volume on CT in order to estimate differential renal function based on differential renal volumes. Thus, the necessity of the nuclear medicine renal scan can be eliminated, reducing the radiographic burden and time commitment of the potential donor and addressing the ongoing scarcity of the necessary radionucleotide. However, these models are rarely used as they are often cost-prohibitive due to the need for proprietary software and they are labor-intensive for radiologists.

Methods: In this study, we examined whether a simplified estimation of differential renal volumes based on the ellipsoid formula (renal volume=ϖldw/6, where l, d, and w represent three dimensions of the kidney) using CT scans, may also adequately estimate differential renal function.

Results: Charts of 79 consecutive living renal donors were reviewed retrospectively. The differential renal volumes measured on CT scans were reliable between operators (p<0.05). We found that the volume-based estimations of differential renal volume were in fact correlated to differential renal function on nuclear medicine scans (r=0.29, p<0.01). We were able to identify the kidney with the greater function in 53 (67%) of the 79 cases, and in all 8 (100%) of 8 cases in which the difference in differential renal function was clinically significant (>10% difference between kidneys).

Conclusions: These findings support removal of the nuclear medicine scan from routine assessment of potential kidney donors without the need for expensive radiologic software, but further research looking specifically at potential donors with clinically significant differential renal function between kidneys is required to confirm our findings.