Division of Urology

Schulich MEDICINE & DENTISTRY

SCHULICH SCHOOL OF MEDICINE & DENTISTRY

JACK WYATT UROLOGY RESIDENTS' RESEARCH DAY 2011

featuring....

The University of Western Ontario

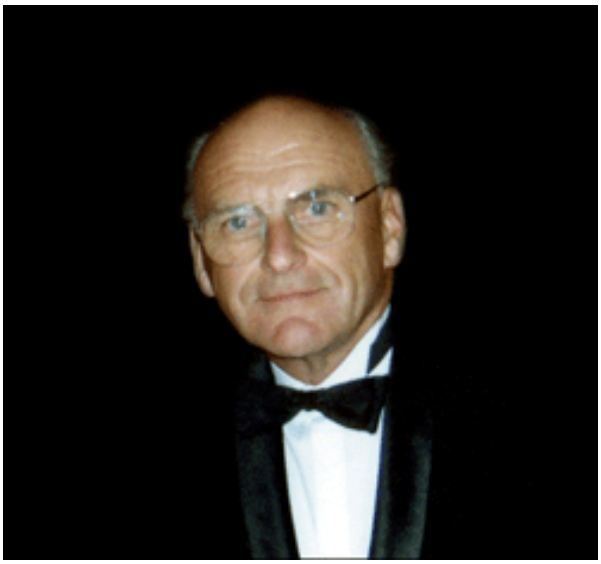
and

McMaster University

The University *of* Western Ontario

Western

Dr. John Kenneth Wyatt



John Kenneth Wyatt was born in Detroit, Michigan and grew up in London, Ontario where he attended the University of Western Ontario, graduating in Medicine in 1954. While an undergraduate at Western, Jack excelled in many sports and was captain of the Western Mustangs football team.

Dr. Wyatt completed his General Surgery and Urology training in London and joined the small Urology faculty here in 1960. He published one of the first papers on the beneficial effects of chemotherapy for testis cancer. Dr. Wyatt steadily built the UWO Urology Program, serving as the Program Director and Division Chair for 15 years. He was best known for his clinical acumen and his caring attitude towards his patients as well as his residents. An excellent clinical teacher, Dr. Wyatt was well-known for his common touch and sense of humor, whether he was lecturing to medical students, doing bedside or operating room teaching, or chatting with the janitor. Dr. Wyatt was an active contributor to the Royal College and the Canadian Urological Association, serving as CUA President in 1984.

Dr. Wyatt passed away December 6, 2004. We continue to honor his memory through our Annual Residents' Research Day.

The University of Western Ontario
Jack Wyatt Urology Residents' Research Day 2011

RESIDENTS:

PGY5
Kirsten Foell – UWO
Ayman Raees – McMaster
Niki Kanaroglou - McMaster

PGY4
Zachary Klinghoffer – McMaster
Jason Kovac - McMaster
JJ Shoebridge – UWO

PGY3
Adeel Sheikh – McMaster
Piotr Zareba - McMaster
Shawna Boyle – UWO
Francisco Garcia - UWO
Paul Martin – UWO
Daniel Yanko – UWO

PGY2
Alym Abdulla – McMaster
Christopher Allard - McMaster
Keith Barrett – McMaster
Varun Bathini – UWO
Michael Lang - UWO
Linda Lee – UWO

PGY1
Rami Elias – McMaster
Eric Cole – McMaster
Ian Wright - McMaster
Kim-Chi Tran – UWO
Peter Wang – UWO
Marie Dion – UWO

GUEST PROFESSOR 2011

Gerald L. Andriole, Jr., MD

Robert K. Royce Distinguished Professor
Chief of Urologic Surgery
Siteman Cancer Center
Barnes-Jewish Hospital
Washington University School of Medicine
St. Louis, Missouri

Gerald L. Andriole, Jr., MD, is the Robert K. Royce Distinguished Professor and Chief of Urologic Surgery at Barnes-Jewish Hospital, the Siteman Cancer Center and Washington University School of Medicine in St. Louis, Missouri.

Dr. Andriole received his medical degree from Jefferson Medical College in Philadelphia, Pennsylvania. He trained in surgery at Strong Memorial Hospital and the University of Rochester and completed urology residency at Brigham and Women's Hospital and Harvard Medical School. Subsequently, he was a fellow in Urologic Oncology at the National Cancer Institute in Bethesda, Maryland.

Dr. Andriole has over 25 years of consistent contributions in the areas of BPH and prostate cancer screening and prevention research. He has contributed well over 225 peer-reviewed publications and abstracts and serves on the editorial boards of several prestigious journals. He is Chairman of the Prostate Committee of the National Cancer Institute's Prostate, Lung, Colorectal and Ovarian (PLCO) Cancer Screening Trial and is on the Steering Committee of the REDUCE Prostate Cancer Prevention Trial. He is a member of the American Urological Association, American Association for Cancer Research, the American Society of Clinical Oncology, American Surgical Association and the American Association of Genitourinary Surgeons among other societies.

gsk GlaxoSmithKline

We thank GlaxoSmithKline for the educational grant in support of Dr. Andriole's visit.

The University of Western Ontario
Jack Wyatt Urology Residents' Research Day 2011

We thank the following industry sponsors for their support!

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Jack Wyatt Urology Residents' Day

featuring McMaster University and the University of Western Ontario

Friday, April 29, 2011

AGENDA

7:00 – 7:30 **Registration and Continental Breakfast**

7:30 – 7:45 **Welcome and Introductions: Dr. H. Razvi & Dr. P. Whelan**

SESSION I **Moderator: Dr. Jonathan Izawa**

7:45-8:00 JJ Shoebridge: Clinicopathological Predictors for Patients Undergoing Nephroureterectomy for Upper Tract Urothelial Carcinoma

8:00-8:15 Z. Klinghoffer: Cost-utility of Radical Nephrectomy versus Partial Nephrectomy in the Management of Small Renal Masses: Adjusting for the Burden of Chronic Kidney Disease

8:15-8:30 L. Lee: High Intensity Focused Ultrasound for Prostate Cancer

8:30-8:45 K. Barrett: Extraperitoneal versus Transperitoneal Laparoscopic Radical Prostatectomy: A Single Surgeon Comparison

8:45-9:15 **State-of-the-Art Lecture I: Dr. Alp Sener**
More or LESS? The Evolution of Minimally Invasive Urology

9:15-10:00 **Health Break**

SESSION II **Moderator: Dr. Paul Whelan**

10:00-10:15 R. Elias: Standardized Communication and Frame of Reference Facilitates Safe and Efficient Laparoscopic Teaching: A Randomized Controlled Study

10:15-10:30 A. Abdulla: Designing a High-fidelity Laparoscopic Partial Nephrectomy Bench Model: Determining the Tear Strength and Resistance of a Synthetic Silicone Composition

10:30-10:45 CB Allard: The Obesogenic Profile of a Cohort of Renal Stone Formers

10:45-11:00 K. Foell: Single Institution Review of the Incidence of Perinephric Hematoma after Shock Wave Lithotripsy

11:00-12:00 **Guest Professor: Dr. Gerald Andriole**
Making Sense of the Prostate Cancer Screening Trials Results

12:00-1:00 **LUNCH**

con't…

SESSION III Moderator: Dr. Anil Kapoor

1:00-1:15 P. Martin: Endoscopic Injection for Vesicoureteric Reflux with Simultaneous 3-Dimensional Ultrasound: a Novel Technique to Image Mound Formation in Real Time

1:15- 1:30 S. Boyle: GU TB or not GU TB: case series and critical look at the changing epidemiology of GU TB

1:30- 1:45 M. Dion: Resistive Indices in Transplanted Kidneys After Cold Perfusion

1:45-2:00 K-C. Tran: The Effects of Carbon Monoxide Releasing Molecule-3 and Hydrogen Sulphide on Renal Protection During Pulsatile Perfusion

2:00- 2:15 D. Yanko: Renal Transplantation - an Assay of Immunologic Activity

2:15- 2:45 **State-of-the-Art Lecture II: Dr. Jehonathan Pinthus**
The Management of Invasive Bladder Cancer in Octagenarians

2:45-3:15 **Health Break**

SESSION IV Moderator: Dr. Gerald Brock

3:15-3:30 J. Kovac: The Relationship Between Sexual Preference Body Image and Pyschosocial Functioning Among Men with Peyronie's Disease

3:30- 3:45 P. Wang: The Effects of Traction Injury on Peyronie's Disease in a Mouse Model

3:45-4:00 F. Garcia: A Durable Novel Rat Model for Peyronie's Disease and the Evaluation of the Efficacy and Histologic Changes of Repeated Intralesional Verapamil Injections in Peyronie's Disease.

4:00-4:15 V. Bathini: The Effects of Sub-Minimum Inhibitory Concentrations of Ampicllin and Gentamicin on *Staphylococcus Saprophyticus*

4:15-5:00 **Guest Professor: Dr. Gerald Andriole**
The Role of Focal Therapy in the Management of Prostate Cancer

5:00-5:45 ***Imaging Contest:*** **Dr. Petar Erdeljan and Dr. Andrew Fuller**

5:45 **Adjournment**

6:30 **Faculty Dinner** (by invitation)

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*Note: Guidelines:
15 minute presentations = 10 minute presentation, 5 minute Q & A
30 minute presentations = 20 minute presentation, 10 minute Q & A
45 minute presentations = 30 minute presentation, 15 minute Q & A

This year's program is intended to provide participants with:

1. An update on the management of muscle invasive bladder cancer in octogenarians.
2. A state-of-the-art review of role of 5-alpha reductase inhibitors in the management of symptomatic benign prostatic hyperplasia as well as their role in prostate cancer risk reduction.
3. A review of the prostate cancer screening trials and their application in clinical practice.
4. An update on the role of focal therapies in the management of clinically localized prostate cancer.
5. Results of clinical and basic science research projects of the resident staff from both McMaster University and the University of Western Ontario in the following subspecialty areas:
    a. Oncology
    b. Pediatrics
    c. Endourology
    d. Transplantation
    e. Andrology
    f. Urinary voiding dysfunction

This event is an Accredited Group Learning Activity (Section 1) as defined by the Maintenance of Certification program of The Royal College of Physicians and Surgeons of Canada and approved by Continuing Professional Development, Schulich School of Medicine & Dentistry, the University of Western Ontario (8.0 hours).

CLINICOPATHOLOGICAL FEATURES OF UPPER TRACT UROTHELIAL CARCINOMA TO PREDICT ADVANCED DISEASE AND OUTCOMES ON SURVIVAL

JJ Shoebridge, J Izawa

PURPOSE: We analyzed the prognostic impact of preoperative clinical characteristics on predicting advanced pathological stage at radical nephroureterectomy (RNU). Analyses of pre-operative clinical, operative and pathological variables were performed to predict differences in overall and disease specific survival.

METHODS: 122 patients were retrospectively identified to have undergone RNU for upper tract urothelial carcinoma (UTTCC) at a single institution between 1996-2011. A database was created to document potential clinical and pathological variables that may predict pathological and survival outcomes. Statistical analyses were performed using Chi-square, Kaplan-Meier survival and Cox regression analysis.

RESULTS: The average patient age was 70.1 years. 57% and 43% of patients underwent open or laparoscopic assisted RNU respectively. Lymphadenectomy was performed in 27%. Independent predictors of nodal positive disease include multifocal tumours ($p = 0.012$), and smoking history ($p = 0.038$). Predictors of disease specific survival include sessile architecture ($p = 0.024$, HR 11.28), lymphovascular invasion (LVI) ($p= 0.03$, HR 2.1), positive cytology ($p= 0.027$, HR 2.51), >pT stage ($p = 0.001$, HR 4.15), high grade ($p=0.024$, HR 7.18).

CONCLUSIONS: Smoking history and multifocal tumours are independent predictors of node positive disease at RNU and may help stratify patients requiring lymphadenectomy. Sessile architecture, LVI, positive cytology, pTstage and high-grade disease predict inferior survival outcomes and may risk stratify patients for adjuvant treatment.

COST-UTILITY ANALYSIS OF RADICAL NEPHRECTOMY VERSUS PARTIAL NEPHRECTOMY IN THE MANAGEMENT OF SMALL RENAL MASSES: ADJUSTING FOR THE BURDEN OF ENSUING CHRONIC KIDNEY DISEASE.

Zachary Klinghoffer, Jean-Eric Tarride, Giacomo Novara, Vincenzo Ficarra, Anil Kapoor, Bobby Shayegan, Luis H. Braga

INTRODUCTION: Increasing evidence suggests that radical nephrectomy (RN) is associated with an increased incidence of chronic kidney disease (CKD) compared to partial nephrectomy (PN) following the treatment of small renal masses (SRMs).

OBJECTIVES: To compare the cost-utility of laparoscopic radical nephrectomy (LRN), laparoscopic partial nephrectomy (LPN) and open partial nephrectomy (OPN) in the management of small renal masses when the impact of ensuing CKD disease is considered.

METHODS: A Markov decision analysis model with a 10-year time horizon. Estimates of costs, utilities, complication rates and probabilities of developing CKD were derived from the published literature. Sensitivity analyses were performed to determine which parameters affected the outcome of our model. The base case patient was assumed to be a 65-year-old male with a <4 cm unilateral renal mass, a normal appearing contralateral kidney and a normal pre-operative serum creatinine.

Costs and quality adjusted life years (QALYs) gained for LRN, LPN and OPN over 10 years.

RESULTS AND CONCLUSIONS: OPN was the least costly strategy at $29351 USD and 7.161 QALYs gained over 10 years. LPN yielded 0.098 additional QALYs at an additional cost of $888 for an incremental cost-effectiveness ratio of $9057 per QALY, well below a commonly accepted willingness-to-pay threshold of $50 000 per QALY. LRN was more costly and yielded fewer QALYs than OPN and LPN. Sensitivity analyses demonstrated our model to be robust to changes to key parameters. LRN was never preferred to OPN or LPN. Age had no effect on preferred strategy, though the net monetary benefit of PN over RN diminished with increasing age.

HISTOPATHOLOGICAL CHANGES AND RECURRENCE FOLLOWING SALVAGE HIGH INTENSITY FOCUSED ULTRASOUND (HIFU) FOR PROSTATE CANCER

L Lee, AM Autran Gomez, S Chan, J Gomez-Lemus, J Chin

INTRODUCTION: Recurrence after radiation therapy for localized prostate cancer is a challenging problem and occurs in 30-40% of patients. Treatment options for salvage therapy include radical prostatectomy, cryotherapy, high-intensity focused ultrasound (HIFU), androgen deprivation therapy and observation. Salvage HIFU is the subject of ongoing investigation. We present the first study describing the histopathological changes in patients undergoing salvage HIFU following external beam radiation or brachytherapy.

METHODS: From April 2006 to September 2009, 49 patients with biopsy-proven recurrent localized prostate adenocarcinoma following primary external beam radiation or brachytherapy were treated with salvage HIFU using Sonablate® 500 by a single surgeon. Biochemical failure was defined using the Phoenix criteria. Follow-up biopsies were performed at 180 days post-HIFU. All biopsies were reviewed by a single pathologist.

RESULTS: Benign histopathological features following salvage HIFU including fibrosis, inflammation, necrosis, atypia and metaplasia are examined. At 180 days post-HIFU, 14 (29%) of patients were found to prostate adenocarcinoma on biopsy and biopsy features of recurrence following salvage HIFU are discussed.

CONCLUSIONS: HIFU may be offered as salvage treatment for local recurrence following external beam radiotherapy or brachytherapy. Our data shows that 71% of patients biopsied had no evidence of disease on biopsy at 180 days post-HIFU. The combination of radiation and HIFU causes many unique histopathologic changes to the prostate tissue. Diagnosis of recurrence following salvage HIFU presents an enormous challenge to pathologists. Ongoing work in this area is important in order to distinguish post-treatment changes from recurrence.

EXTRAPERITONEAL VS TRANSPERITONEAL LAPAROSCOPIC RADICAL PROSTATECTOMY: A SINGLE SURGEON COMPARISON

Keith Barrett, Edward Matsumoto

INTRODUCTION: Over the last two decades, laparoscopic radical prostatectomy (LRP) has been shown to be a viable, less invasive option to the treatment of localized prostate cancer. This was initially accomplished via a transperitoneal approach (tLRP), with the later development of an extraperitoneal technique (eLRP). Both approaches remain in practice today, often co-existing in the same surgical center.

OBJECTIVE: The primary objective of this study was to compare the peri-operative results of tLRP and eLRP when both are performed in the hands of a single surgeon at St Joseph's Healthcare Hamilton (SJHH). The secondary objective was to compare early continence outcomes.

METHODS: The most recent 50 tLRP and 50 eLRP patients undergoing surgery at SJHH by EDM up to September 2009. The limit of September 2009 was chosen to allow for comparison of continence rates and erectile function at 1year follow up. Pre-operative patient characteristics of age, ASA class, and BMI were considered. Tumor and gland characteristics of PSA, TRUS prostate volume, specimen weight, and gleason score were examined. Peri-operative outcomes of interest included operative time, intra-operative blood loss, overall decrease in hemoglobin concentration, transfusion rate, urine leaks, lymphocele rate, length of stay (LOS), and other complications in the peri-operative period. Early continence outcomes included complete continence rates (defined as no pads worn) as well as patients wearing two or less pads per day at 6 weeks, 3, 6, and 12 months.

RESULTS: Pre-operative patient, tumor, and gland characteristics were comparable between groups. Operative time, intra-operative blood loss, and overall decrease in Hb concentration were essentially identical between groups. LOS for the tLRP cohort was 52.24 hrs (95% CI = 45.89 to 58.59 hrs) and 47.36 hrs for the eLRP cohort (95% CI = 44.46 to 50.26 hrs, $p = 0.16$). Three patients in the tLRP group (6%) received transfusions, while no patients in the eLRP group did ($p = 0.24$). There were 3 urine leaks in the tLRP group (6%) and 5 in the eLRP group (10%, $p = 0.72$). One rectal injury occurred in the tLRP group. No lymphoceles were recorded in either group. The nearly all patients were using two or less pads by 6 months (tLRP = 93.8%, eLRP = 90.1%, $p = 1.00$) with the majority of patients in each group achieving complete continence by this time (tLRP = 62.5%, eLRP = 60.61%, $p = 1.00$). Continence results at 12 month follow up were comparable to those at 6 months

Conclusions: There is no significant difference in terms of either peri-operative or early continence outcomes between tLRP and eLRP. The choice of surgical approach for patients undergoing LRP should be directed by surgeon preference and comfort level.

STANDARDIZED COMMUNICATION AND FRAME OF REFERENCE FACILITATES SAFE AND EFFICIENT LAPAROSCOPIC TEACHING: A RANDOMIZED CONTROLLED STUDY

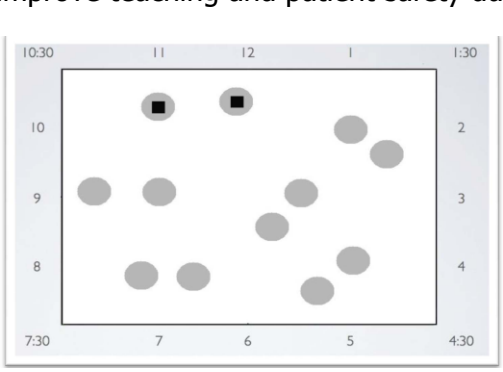
Bechir Hage, Rami Elias, David Williams, Forough Farrokhyar, Edward D. Matsumoto, Hamilton, Canada*

INTRODUCTION AND OBJECTIVES: During laparoscopic procedures, communication between the attending surgeon and the novice trainee is paramount. While teaching laparoscopic surgery, attending must direct the novice to certain points in the surgical field. Without standardized frames of reference (FOR) the directions can become confusing and frustrating. We designed a novel FOR overlay and standardized verbal commands to facilitate intraoperative teaching and directing. The objective of this study was to determine the impact of the FOR overlay used with a standardized language on the performance of laparoscopic tasks.

METHODS: Forty-two medical students were randomized to two groups: group 1 (control) performed tasks with no overlay, the commands were limited to simple directions such as left, right, up and down; group 2 performed tasks on a overlay with commands based on a clock and x:y triangulation (fig 1). All subjects performed three different trials, each consisting of 6 bean transfers, while instructed with one of the two methods. Time to task completion and "error score" defined as the number of times the bean is moved to a wrong circle were recorded and analyzed using non-parameteric statistics.

RESULTS: Group 2 was faster than the control for all three trials (63,67,51 vs 87,80,71s respectively)($p<0.05$). The error scores were lower for group 2 compared to the control, approaching significance in trial 1 (1.33 vs 1.67, $p=0.07$) and significant in trial 3 (1.26 vs 1.74, $p=0.012$). No significant differences were seen in trial 2 (1.4 vs 1.6, $p=0.32$).

CONCLUSIONS: Using a FOR overlay and standardized communication for directing in laparoscopy improves performance and error. This proof of concept will be used to develop a video inlay FOR for endoscopy monitors. The development and validation of standardized communication and FOR will improve teaching and patient safety during laparoscopy.



-Fig 1: Bean transfer with clock overlay (group 2) –
Step 1: Move 11' bean to 9` circle
Step 2: Move 2'bean to the (4; 5) circle
Step 3: Move 7' bean to the (1; 2) circle
Step 4: Move the 12' bean to the (7:8) circle
Step 5: Move 9' bean to the 7' circle
Step 6: Move (7; 9) bean to the 3' circle

Source of Funding: None

DESIGNING A HIGH-FIDELITY LAPAROSCOPIC PARTIAL NEPHRECTOMY BENCH MODEL: DETERMINING THE TEAR STRENGTH AND RESISTANCE OF A SYNTHETIC SILICONE COMPOSITION.

Alym Abdulla, Abdulaziz A. Alamri, John Madjeruh, Bobby Shayegan, Kevin Piercey, John Paul Whelan, Anil Kapoor, Edward D. Matsumoto, Hamilton, Canada

INTRODUCTION AND OBJECTIVES: Teaching and learning laparoscopic partial nephrectomy (LPN) is challenging. A bench model that simulates tissue handling and fidelity to a real kidney would be highly valued. We previously studied and
measured the tear strength and tissue resistance of human kidneys. The objective of this study was to assess the tear strength and tissue resistance of various synthetic silicone compositions to develop a LPN bench model with high-fidelity tissue handling characteristics.

METHODS: Different silicone samples were made by adding varying percentages of platinum silicone additive (0%, 5%,
10%, 15% and 16%). This resulted in samples with different consistency and texture. Using ten samples of each composition, the tear strength was measured by placing a 2/0 vicryl through each sample, which was attached to a strain gauge fixed within a standardized traction applying apparatus. The tear strength reading was taken at the moment the suture began tearing the material. The resistance of the silicone samples was measured using a commercial Durometer fixed to a Keith needle. The tear strength and resistance values from these samples were compared to readings from human kidneys. Kruskal-Wallis non-parameteric statistics were utilized.

RESULTS: The median tear strength for the 0%, 5%, 10%, 15% ,16% and human kidney samples were 1900, 645, 665,
460, 210, 445 grams respectively. Post-hoc analysis showed there was no difference between the 15% sample and the human kidney ($p=0.97$). The median resistance values for the same samples were 80, 62, 112, 85, 89 and 26 units respectively. There were statistically significant differences noted ($p<0.05$) and none of the silicone samples was found to have similar resistance values to the human kidney.

CONCLUSIONS: We found that the 15% silicone sample had similar tear strength to that of human kidneys. All of the silicone samples, including the 15%, had needle resistance much greater than the human kidney. However, we feel tear strength of tissue is essential for teaching suturing and suture tying, as this is a critical construct of learning LPN. The next phase of our study will be the development of the final LPN model using the 15% platinum silicone composition and validation.

Source of Funding: Surgical Associates Grant - McMaster University

OBESOGENIC PROFILE OF A COHORT OF NORTH AMERICAN RENAL STONE PATIENTS

Anatoly Shuster, Christopher B Allard, Ayman Raees, Michael Patlas, Edward D Matsumoto, Jehonathan H Pinthus, J Paul Whelan*

INTRODUCTION AND OBJECTIVES: Obesity is linked to increased rates of renal stone (RS) formation and treatment failures, and is usually defined according to body mass index (BMI). BMI has inherent limitations as a measure of obesity and fails to account for fat distribution, a more accurate predictor of morbidity. Patterns of fat distribution may affect the success of extracorporeal shockwave lithotripsy (ESWL), since peripheral adipose tissue increases the skin-to-stone distance more than does visceral adipose tissue (VAT). The objective of this study was to characterize the fat distribution and metabolic hormonal milieu in a cohort of RS patients.

METHODS: 113 patients (73 male; 40 female; mean age 54 years) undergoing treatment for RS between November 2009 and June 2010 at one center were prospectively enrolled; 81 met inclusion for BMI analysis and 63 for %VAT. CT scans were analyzed for visceral and subcutaneous adipose tissue volumes from axial slices at 3 fixed levels (L2 vertebral body, umbilicus and anterior superior iliac spine) using commercial software (Clear Image Demo). Adipose tissue was defined as -250 to -30 Hounsfield Units. The ratio of visceral to total adipose tissue (%VAT) was calculated and BMI data collected. Adiponectin and leptin levels of fasting serum samples were measured by ELISA.

RESULTS: 28% of patients had BMI within the normal range (<25kg/m2), while 32% were overweight (25<BMI<29.9kg/m2), 21% obese (30.1<BMI<35kg/m2) and 19% morbidly obese (BMI>35kg/m2). Mean BMI was 30kg/m2. 54% of females and 32% of males were obese or morbidly obese (BMI>30kg/m2). Mean %VAT was 47.7 and 29.7 for males and females respectively ($p<0.001$), indicating relatively higher visceral adiposity in males, and peripheral adiposity in females. Mean levels of adiponectin and leptin were 7.67 and 17.50 respectively (normal values are 10ìg/ml and 10 ng/ml respectively).

CONCLUSIONS: In this cohort of RS patients, males had a higher proportion of visceral adiposity than females (%VAT 47.7 vs. 29.7), while more females were obese or morbidly obese according to BMI. The gender differences in fat distribution may affect ESWL success; obese females have more peripheral adiposity, increasing the skin-to stone distance and, consequently, the probability of ESWL failure. Mean serum levels of adiponectin and leptin indicate that these RS patients are at risk of obesity-related metabolic disorders and higher perioperative complication rates. These associations should be further investigated in a larger multicenter cohort.

Source of Funding**:** none

PERINEPHRIC HEMATOMAS AFTER SHOCK-WAVE LITHOTRIPSY ON SLX-F2 LITHOTRIPTOR: MATCHED CASE-CONTROL ANALYSIS OF POTENTIAL RISK FACTORS

CE Mendez-Probst, R Leistner, K Foell, L.Nott, S Dave, H Razvi

INTRODUCTION: Renal bleeding is a potentially serious complication of extracorporeal shock wave lithotripsy (SWL), with a reported incidence of between 0.2% and 30%. The aim of this study was to determine the incidence of and evaluate potential risk factors for the development of symptomatic post-SWL perinephric hematoma with the latest generation shock wave lithotripter.

METHODS: From April 2006 to August 2010, 6172 SWL treatments for proximal ureteral and renal stones were performed using the Storz Modulith SLX-F2. Data was collected prospectively for patient age, gender, BMI, stone size and location, shock wave number, energy level and frequency, medications, and the existence of hypertension and/or diabetes. Hematomas were detected by imaging (CT) when patients developed suggestive signs or symptoms post-procedure (eg. severe pain, nausea, bruising, hemodynamic changes). The incidence of hematoma formation was calculated with the number of SWL procedures targeting renal or proximal ureteral stones as the denominator. A matched case-control study was performed, with 4 controls matched for each hematoma case based on: sex, age (± 5 years), shock wave rate, energy and number, and no SWL within previous 6 months. The imaging and chart were retrospectively reviewed for each case and control patient. Baseline characteristics were compared between the cases and controls with a Student t-test. A conditional logistic regression analysis was performed to assess the independent variables hypertension (intraoperative, > 140/90), anticoagulant/antiplatelet drugs, obesity (BMI ≥ 30) and diabetes; the dependent variable was hematoma. SPSS version 9.2 was used for statistical analysis and a p-value of 0.05 was considered significant.

RESULTS: Following SWL, 21 patients developed clinically apparent perinephric hematomas. All patients had stones treated in the kidney or proximal ureter, for an overall incidence of 0.34%. Nineteen (90.5%) were male and 2 (9.5%) were female. The mean age of affected patients was 55.2 ± 15.4 years. No ancillary procedures (eg. angioembolization) were required. All 15 patients who were treated for their hematoma at our centre were symptomatic: 14 with pain, 4 with nausea and vomiting. Two had hemodynamic changes, and 1 developed flank ecchymosis. Four patients (26.7%) required transfusion. The mean length of hospital stay was 3.6 ± 2.5 days. Male sex was a risk factor for hematoma formation Intraoperative hypertension (HR 3.302, 1.066 – 10.230, p = 0.0384), and anticoagulant/antiplatelet drugs (HR 4.198, 1.103-15.984, p = 0.0355) were significant risk factors. Obesity (p=0.1021) and diabetes (p=0.1043) were not risk factors.

CONCLUSIONS: The incidence of perinephric hematomas with SLX-F2 is less than 1% and consistent with reports with earlier generation devices. Male gender, intraoperative hypertension, and the use of anticoagulant/antiplatelet drugs were risk factors for hematoma formation.

ENDOSCOPIC INJECTION FOR VESICOURETERIC REFLUX WITH SIMULTANEOUS 3-DIMENTIONAL ULTRASOUND: A NOVEL TECHNIQUE TO IMAGE MOUND FORMATION IN REAL TIME

Paul Martin [1], *Cesare Romagnoli* [2], *Aaron Fenster* [3], *Sumit Dave* [1]

[1]Department of Surgery - Division of Urology, University of Western Ontario, London, ON, Canada; [2]Medical Imaging, London Health Science Centre, London, ON, Canada; [3]Imaging Research Laboratories, Robarts Research Institute, University of Western Ontario, London, ON, Canada.

INTRODUCTION AND OBJECTIVE: Adequate mound formation and volume of injection are two of the factors that correlate with correction of vesicoureteric reflux (VUR) following endoscopic injection. 3D Ultrasound (3D-US) is a new imaging modality that allows for real-time 3-dimentional imaging and has an increasing number of urologic applications. We present a novel method of visualizing mound formation during endoscopic injection using simultaneous 3D-US.

METHODS: Institutional ethics board approval was obtained. Consecutive children undergoing endoscopic injection for VUR were included. A trans-rectal US probe was used to capture a 3D image of the ureterovesical junction (UVJ) before, during, and after injection. 8 children (mean age 6.4) underwent dextranomer/hyaluronic acid injections with simultaneous 3D-US in a total of 12 refluxing ureters (VUR grade II-IV) using the double-HIT technique. Success is defined as resolution of VUR on voiding cystourethrogram (VCUG) 2 or 3 months post-operatively.

RESULTS: The technique was feasible, with no immediate or early post-operative complications. Using 3D-US, the mound can be seen forming along the course of the intramural ureter during injection, which cannot be seen cystoscopically. A 3D image of the UVJ guides injection and confirms satisfactory mound formation. Post-operative VCUG demonstrated resolution of VUR in 9 of 12 ureters and improvement of VUR in 2 of 12 ureters.

CONCLUSIONS: 3D-US during endoscopic injection can be safely performed and offers additional information to the surgeon. A real-time and objective assessment of mound quality may improve injection success rates. Future aims would include using 3D-US to avoid unnecessary high volume injections, and potentially avoid follow-up VCUGs.

GU TB OR NOT GU TB: CASE SERIES AND CRITICAL LOOK AT THE CHALLENGING EPIDEMIOLOGY OF GU TB

SL Boyle, J Chin, J Izawa, S Pautler, J Denstedt, J Amann, H Razvi

Genitourinary tuberculosis can present with a wide variety of symptoms and has no single unifying pathopneumonic presentation. Despite treatment protocols and criteria for high risk individuals the number of reported cases of tuberculosis in Canada has been relatively stable over the past 10 years.[1] Of these 37-43% of the cases are within the province of Ontario, and 2.5-3.8% of all presentations involve the genitourinary system. Between 1997-2008, an average of 14 cases of genitourinary tuberculosis were reported per year in Ontario.[2]

We present a case series of 5 presentations of GU TB in London, Ontario over the past 8 years. There were four females, and one male with an age range at presentation from 45-80. There are two presentations of TB kidney, one primary in the bladder presenting with gross hematuria, ureteric stricture disease and a left testicular mass. All of these cases are confirmed with AFB stains on tissue or urine specimens. None of the patients had a personal history of known tuberculosis. Four of the five patients were not born in Canada but all had chest x-rays for immigration.

We will review the main radiologic and clinical findings for each of these patients to reflect the ways in which TB can present for the genitourinary system. Although a rare diagnosis, it is not one which should be forgotten in our differential, as it is neither historic nor declining in its rates of presentation.

[1] Tuberculosis in Canada, 2009, Pre-release. Public Health Agency of Canada
[2] Data Received from: Canadian Tuberculosis Reporting System, March 2011, Victor Gallant

PULSATILE RENAL PERFUSION IMPROVES DOPPLER INDICES OF INTRA-RENAL BLOOD FLOW AND ALLOGRAFT FUNCTION IN RENAL TRANSPLANTATION

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INTRODUCTION AND OBJECTIVE: Increasing evidence suggests that pulsatile-perfusion (PP) of transplanted kidneys (TX) may improve long-term renal allograft function compared to cold storage alone; whether this applies to kidneys obtained from donors after cardiac death (DCD) remains unknown. We examined whether PP improved DCD renal allograft survival compared to kidneys preserved in cold storage. In addition, we evaluated whether Doppler perfusion indices were predictive of long term graft function and survival.

METHODS: We identified 22 patients who received renal TX. Group A (n=6) received the first of a pair of kidneys, Group B (n=6) received the second of the pair after it was placed on PP while its mate (Group A) was transplanted. Group C (n=10) consisted of a matched cohort of recipients who had also received the second of a pair of donor kidneys without PP storage. Patient and donor demographics were collected, Doppler ultrasound was done on day 7 and resistive indices (RI) calculated, GFR was determined using the MDRD for 6 months after TX.

RESULTS: Group B had the longest cold ischemic times (854 min) compared to Group A (567 min, $p = 0.039$) and Group C (563 min, $p= 0.010$). Despite this, Group B had the lowest Doppler RI's following TX compared to both Groups A and C which showed similar Doppler indices (Figure 1, $p = 0.035$). GFR trended to be better in Group B compared to Groups A and C throughout the follow-up period, becoming significant at 3 months post-TX (Figure 2).

CONCLUSIONS: Doppler ultrasound indices may be a predictor of long-term graft function in DCD kidney transplants. Pulsatile perfusion of DCD kidneys appears to positively impact long-term allograft function compared to static cold storage.

Source of Funding**:** None

THE EFFECTS OF CARBON MONOXIDE RELEASING MOLECULE-3 AND HYDROGEN SULPHIDE ON RENAL PROTECTION DURING PULSATILE PERFUSION

Kim-Chi Tran, Amira Alabbassi, Michael Bloch, Jian Deng, Amy Mok, Weihua Liu, Bertha Garcia, Alp Sener, Patrick Luke

INTRODUCTION AND OBJECTIVES: Studies on small animal models have shown that through their vasodilatory and antiapoptotic properties, carbon monoxide releasing molecules (CORM)-3 and hydrogen sulphide (H2S) can protect kidneys during prolonged periods of cold storage. This study expands on previous work by assessing the effect of CORM-3 and H2S on pump resistance, cell injury, and apoptosis in the cold perfused porcine kidney.

METHODS: Ten kidneys were procured from domestic farm pigs, flushed with heparinized solution after 5 minutes of warm ischemia, and placed on the Lifeport perfusion pump at 4°C for 48 hours. The kidneys were randomly assigned to one of four treatment groups: control cold storage (n=2), control cold pulsatile perfusion (n=2), 100 μM CORM-3 pulsatile perfusion (n=4), or 200 μM H2S pulsatile perfusion (n=2). Perfusion flow and resistance were recorded, and the kidneys were stained for TUNEL and histology was assessed.

RESULTS: Compared with control kidneys, pulsatile perfusion with H2S showed decreased $TUNEL^{+}$ cells (4.5/10 hpf) versus control kidneys (10.5/10 hpf) (p=0.007), and perfusion with CORM-3 showed a decrease in glomerular necrosis. Mean vascular resistance was lower in both CORM-3 and H2S kidneys versus control kidneys (p=0.0003 and p=0.0008). Accordingly, mean flow was higher in the H2S group versus control (p=0.009) at 1 hr. Even by 47 hr, perfusion parameters were superior in H2S-treated kidneys (p = 0.003).

CONCLUSIONS: This preclinical pilot study shows that both CORM-3 and H2S play a role in decreasing cell injury and improving perfusion parameters in kidneys undergoing cold pulsatile perfusion. This provides rationale to assess both agents in combination and to assess the ability of these small molecules to protect the graft against storage injury in porcine transplant models.

PRE OPERATIVE IMMUKNOW CYLEX ASSAY PREDICTS REJECTION RISK IN KIDNEY TRANSPLANT PATIENTS

D Yanko, F Myslik, T McGregor, S Langford, Y Caumartin, J Warren, MJ Edgar, F Rehman, A Jevnikar, A House, P Luke

INTRODUCTION AND OBJECTIVES: Currently, immunotherapy is titrated based on toxicity and drug levels, independent of the true immune state. The ImmuKnow assay measures cell-mediated immunity by quantifying ATP release from CD4+ T-cells in peripheral blood. Theoretically, patients with lower levels are predisposed to infection/malignancy, while higher values are associated with rejection. We hypothesized that this assay could predict complications associated with over/under-immunosuppression in kidney transplant (KT) patients.

METHODS: Sixty-seven patients undergoing KT were recruited prospectively and had ATP levels measured pre-operatively, and at specified intervals over 2 months. Clinical events including rejection, infection/malignancy were documented with a median follow-up of 21 months (3-35). Parameters including absolute ATP levels and changes in ATP patterns (slopes, delta) were analyzed. Association between ATP parameters and clinical outcomes were compared using the likelihood ratio and Kaplan Meier curves.

RESULTS: Absolute ATP values post-operatively had poor predictive value with regards to rejection or infection/malignancy. As well, changes in ATP values were poorly associated with complications. Importantly, patients with pre-transplant ATP values $\leq$ 300 ng/ml had significantly less rejection episodes vs. those with ATP values > 300 ng/ml ($p<0.0001$). As well, the $\leq$ 300 ng/ml group also had significantly delayed time to rejection event vs. the > 300 ng/ml group ($p<0.05$). There were no significant differences in gender, age, etiology of renal failure, immunotherapy, or sensitization risk (%PRA, HLA match) between these two groups.

CONCLUSIONS: For the first time, we have evidence that a pre-operative ImmuKnow level can stratify KT patients into low/high risk groups for rejection. Future studies to assess the utility of this assay to design individualized immunosuppressive regimens are required.

THE RELATIONSHIP BETWEEN SEXUAL PREFERECE, BODY IMAGE, AND PSYCHOSOCIAL FUNCTIONING AMONG MEN WITH PEYRONIE'S DISEASE

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INTRODUCTION: Peyronie's disease results in penile deformity, pain and erectile dysfunction (ED) with broad psychosocial effects that are widely prevalent, but incompletely understood. Conceptual models of Peyronie's disease (PD) have identified multiple areas that contribute to patient well-being including perceptions of physical appearance and body image. A paucity of data exists regarding the effects of PD on these variables in homosexual, relative to heterosexual men.

METHODS: A cross-sectional study of 237 men at a single center was conducted via questionnaire. Men with congenital curvature and those who did not complete the questionnaire were excluded from the analytic sample (n=198). A validated measure of erectile function (IIEF) was used. Chi-square analyses evaluated the relationship between sexual preference, PD characteristics, body image and ED.

RESULTS: Homosexual preference was reported in 26 men (13%) while 172 men (87%) indicated a heterosexual preference. No significant differences between these groups were observed with respect to age, socioeconomic characteristics or overall health status. Homosexual men were more likely to report moderate to severe ED relative to straight men (84% vs. 37%, $p < 0.001$). Furthermore, homosexual men were less likely to accept their
bodily appearance (50% vs. 82%, $p < 0.001$) and were more likely to be very concerned about the appearance of their penis (77% vs. 50%, $p=0.01$). Sexual preference had no impact on perceived loss of masculinity, difficulty with penetration or penile pain. While homosexual men were less likely to pursue surgical intervention, this difference did not achieve statistical significance (27% vs. 42%, $p=0.13$).

CONCLUSIONS: Psychosocial functioning and body image are negatively affected in PD. Homosexual men reported a significantly higher level of dysfunction relative to heterosexual men. Penile appearance was a greater source of concern for homosexual men – a perception which resulted in a lower acceptance of bodily appearance and increased rates of ED. As such, homosexual men should be considered a subgroup of those affected with PD and their unique concerns taken into account during treatment.

A PILOT STUDY EVALUATION THE EFFICACY OF TRACTION THERAPY FOR PEYRONIE'S DISEASE ON A NOVEL RAT MODEL.

PZT Wang, Ling De Young, Eric Chung, Gerald Brock

The efficacy of traction therapy for the treatment of Peyronie's disease (PD) is controversial without basic histological support but appears to be gaining in popularity and widespread use. This pilot study evaluates the morphological, histological and functional changes associated with traction therapy on a novel rat model for PD.

Adult male Sprague-Dawley rats aged 20-24 weeks received intratunical injections of TGF-beta-1 and Tetradecyl Sulphate at Day 0 and Day 7 for induction of a durable penile plaque. At 4 weeks, the rats were divided into a traction group and a control group. The traction group underwent microscopic surgery where 2 plicating horizontal mattress sutures were placed on each side of the stable plaque to exert longitudinal stress. At week 6, an additional plicating suture was placed on each side to assure adequate tension. The control group received no interventions. Penile pressures were measured in triplicates on all rats using cavernous nerve electrostimulation. They were sacrificed for gross and histological analysis at week 8.

Gross examination of penile curvature did not show a significant difference between the traction and control groups. On histological examination, the plaque is shown as an area of increased non-polarized collagen deposit within the tunica albuginea on the left (Figure 1). This area is smaller with less non-polarized collagen in the traction group compared to the control group. The penile pressures of both the control and traction groups are shown in Figure 2. The traction group achieved higher penile pressures than the control group with cavernous nerve electrostimulation.

Traction therapy is a novel approach for the treatment of Peyronie's disease. The results of this pilot study shows evidence of histological and functional improvement in the traction group. Further study is warranted.

A DURABLE NOVEL RAT MODEL FOR PEYRONIE'S DISEASE AND THE EVALUATION OF THE EFFICACY AND HISTOLOGIC CHANGES OF REPEATED INTRALESIONAL VERAPAMIL INJECTIONS IN PEYRONIE'S DISEASE.

Francisco Garcia[1,2], *Ling De Young*[2,3], *Eric Chung*[2,3] *and Gerald Brock*[2,3]

[1]Schulich School of Medicine & Dentistry, University of Western Ontario, London, ON; [2]Department of Urology, St. Joseph's Health Sciences Centre, London ON, [3]Lawson Health Research Institute, London ON

INTRODUCTION: Peyronie's Disease (PD) is a benign disease of localized fibrous plaque formation affecting approximately 5% of the male population with a significant impact on sexual health. While many therapies have been suggested only intralesional verapamil has demonstrated clinical benefits but the histological effects have not been investigated. Further, a durable and practical animal model for further study does not exist. This is a multi-phase study to examine develop a novel model and the response to treatment.

METHODS: Our model used intratunical Tromboject (Tj), a sclerosing agent, with transforming growth factor beta-1 (TGFb1), compared to the accepted model of TGFb1 intratunical injections. 22 male Sprague-dawley rats were injected with Tj, TGFb1 or both (9, 3 and 10 respectively) and repeated 1 week later. Rats were then sacrificed at 1, 3 and 6 weeks in the Tj group, 6 weeks in the TGFb1, and 9 weeks in the combined group. The combined group was divided into controls (2), intralesional saline (3) and verapamil (5) therapy performed 3 times per week for 2 weeks. Penile pressure studies and histologic analysis was performed.

RESULTS: Gross curvature was noted at 3 and 6 weeks in the Tj group. The combined controls demonstrated gross curvature and palpable scar at 9 weeks. No difference was seen between controls and saline injection but the verapamil group showed a decrease in plaque size and curvature. Trichrome stains demonstrate increased disorganized collagen most pronounced in the combined group followed by the Tj group and TGFb1 group with significantly improved histologically in the verapamil group

CONCLUSIONS: Combination Tj with TGFb1 is a superior model for severe PD in the rat. Plaque formation is more severe, and gross deviations were identified which has not been previously reported. Durability has been demonstrated up to 9 weeks whereas previous models have been shown to resolve spontaneously. Gross and histologic improvements were identified in the verapamil group compared to controls and saline, supporting the pharmacologic role of verapamil and disputing the role of mechanical plaque disruption in plaque remodelling.

THE EFFECTS OF SUB-MINIMUM INHIBITORY CONCENTRATIONS OF AMPICLLIN AND GENTAMICIN ON *STAPHYLOCOCCUS SAPROPHYTICUS*

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BACKGROUND AND PURPOSE: *Staphylococcus saprophyticus* is a frequent cause of both uncomplicated and complicated urinary tract infections (UTI). Originally isolated as an environmental organism associated with decaying biological materials, it has recently been established as one of the most prominent Gram-positive uropathogens. Although the effects of sub-Minimum inhibitory concentrations of antimicrobials (MIC) on numerous other pathogenic bacteria have been studied, little is known regarding how *S. saprophyticus* responds under such conditions. We are currently investigating how *S. saprophyticus* responds to sub-MIC of various antibiotics. Recent work by our group has shown that there is an increased adherence to ureteral stent material and bladder cells in the presence of sub-MIC levels of ciprofloxacin.

MATERIALS AND METHODS: In this study, we investigated other classes of commonly used antibiotics in the treatment of UTI including penicillins and aminoglycosides. Specifically, we investigated the effects of sub-MIC of ampicillin (AMP) and gentamicin (GEN) on *S. saprophyticus* attachment to glass microscope slides, auto-aggregation, and survival to subsequent bactericidal exposure to each agent.

RESULTS: *S. saprophyticus* adherence to microscope slides, cell clustering and survival to bactericidal antimicrobial levels were all significantly increased following treatment with sub-MIC levels of both antimicrobials.

CONCLUSIONS: Our results demonstrate that exposure to sub-MIC levels of several clinically-relevant antimicrobials increases *S. saprophyticus'* surface adherence and auto-aggregation, and increases its survival to typical bactericidal levels of the same agents. This research highlights the need for clinicians to consider the impact of sub-inhibitory concentrations of antimicrobials on bacteria when designing treatment strategies to manage UTI.

PREVIOUS RESIDENTS' DAY GUEST PROFESSORS
1984 – 2010

2010	Dr. John Michael Fitzpatrick
2009	Dr. Antoine Khoury
2008	Dr. Margaret Pearle
2007	Dr. Martin Gleave
2006	Dr. Leonard Zinman
2005	Dr. Joseph A. Smith Jr.
2004	Dr. Anthony Atala
2003	Dr. Peter T. Scardino
2002	Dr. Inderbir Gill
2001	Dr. Shlomo Raz
2000	Dr. Donald Lamm
1999	CUA in London, no Residents' Day
1998	Dr. Patrick Walsh
1997	Dr. Joseph Oesterling
1996	Dr. Michael Marberger
1995	Dr. E. Darracott Vaughan
1994	Dr. Martin Resnick
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1988	Dr. Gerald Sufrin
1987	Dr. Alvaro Morales
1986	Dr. J. Edson Pontes
1985	Dr. Alan Perlmutter
1984	Dr. Alan Bennett

Imaging Contest Answer Page

Contestants Name: _____

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