Introduction: According to the American Cancer Society, one in every three Americans will face a cancer diagnosis in their lifetime. For patients, loved ones, and caregivers dealing with a diagnosis of cancer, an overwhelming amount of information must often be digested while processing life-altering—or even life-threatening—news and making important decisions about treatment options.

Oncologic pathology reports are one such document that dictates options for patient management. Patients are not the target stakeholders of pathology reports and limited resources are available to help patients understand this data. Though many educated patients desire access to information about their cancer diagnosis, medical terminology is often a barrier to understanding their pathology reports and the average readability of most urologic pathology reports may be well beyond the average American's reading level.

As electronic health records continue to evolve, patients will have the ability to view, download, and transmit their health information online. In 2009, the Health Information Technology for Economic and Clinical Health Act (HITECH Act) was passed and represented one of the most concerted efforts by the US government to promote the adoption of electronic health records. The act mandated that physicians utilize technology in meaningful ways (“meaningful use” criteria) to encourage the development of medical technology that promotes patient engagement, improves public health, and facilitates the exchange of information between patients and providers. As health-related technologies are increasingly implemented, efforts are needed to make patient-related information accessible and comprehensible.

Patient-centered pathology reports for a disease like bladder cancer would align with these criteria and promote these objectives. Bladder cancer has the highest per person treatment cost of any cancer and is the 5th overall most costly cancer (over $3 billion per year, over $200,000 per patient). Bladder cancer also disproportionately affects men and women of low socioeconomic status; less educated patients are more likely to have misconceptions about their cancer, decreased understanding of their treatment options, and overestimated chances of a cure.

We believe patient-centered reports would directly meet the prevalent need for patient-centered cancer resources, and address an overlooked aspect of cancer care by improving the communication of clinically salient points while promoting patient understanding, increasing patient involvement, and enhancing patient-doctor communication. Here we describe the development and implementation of patient-centered pathology reports for patients diagnosed with bladder cancer at the University of Washington.
EFFECT OF CONTRAST MEDIA ON URINARY CYTOPATHOLOGY SPECIMENS
Michael J Metcalfe, M.D.; Peter Raven, PhD; Ladan Fazli, M.D.; Alan I So, M.D.: Vancouver, BC, Canada

Introduction and Objective: Both contrast media and cytopathology are used concomitantly during the evaluation of hematuria, abnormal upper tract filling defects or for surveillance post diagnosis or urothelial carcinoma. The accuracy of urine cytology from the upper tracts has traditionally been poor. Both technical and histopathological characteristics may play a role in the poor results from upper tract urinary specimens. Instumentation may play a significant role and this has been shown. Contrast media may play a role in upper tract surveillance and its effect on cytology is relatively unknown.

Methods: Three human cell lines were obtained from ATCC\textsuperscript{R} tumor cell panels. The cell lines include SV-HUC, a benign human epithelial cell line as the control, group A (ATCC SV-HUC). UC-3 minimally aggressive, low grade human urothelial cancer cell as group B (ATCC CRL-1749). And, RT-2 an aggressive high grade urothelial cancer cell line as group C (ATCC HTB-2). Each cell line was reconstituted into 1 cc of each of the nine experimental solutions: 1)water, 2) saline, 3) human urine, 4) Conray\textsuperscript{TM} 100% (iothalamate meglumine 60%, monobasic sodium 12.5%), 5) Conray\textsuperscript{TM} 50%, human urine 50%, 6) Conray 10%/human urine 90%, 7) Ominpaque\textsuperscript{TM} 100% (iohexol 70%), 8) Omnipaque\textsuperscript{TM} 90%/Urine 10%, 9) Omnipaque\textsuperscript{TM} 10%/Urine 90%. Each cell line was exposed to each of the solutions for 10 seconds, 1 minute and 5 minutes. Once exposure was complete 1cc of 97%methonol, 3% acetone solution was used to preserve the cells and they were stored at 4C. They were then analysed by H&E staining by a single pathologist with subspecialty training in cytopathology.

Results: There was no cytological differences seen when cells of the same cell line were exposed to a variance of contrast mediums at for any of the exposure time. Cells exposed to water for greater than 10 seconds had hydropic degeneration.

Conclusion: Contrast media has no effect on urinary cytology for an exposure of up to 5 minutes.
IDENTIFYING A PANEL OF DNA METHYLATION MARKERS TO PREDICT BLADDER CANCER STAGE

(Presentation to be made by Leo Dalag)

Introduction: Approximately 70% of bladder cancer (BC) is identified as non-muscle-invasive at initial presentation. However, progression to muscle-invasive bladder cancer (MIBC) has been reported to occur in 15% of patients, portending a poorer prognosis. Unfortunately, transurethral resection of bladder tumors (TURBT) for the diagnosis and staging of BC cannot accurately identify all cases of MIBC. We seek to address the clinical understaging of bladder cancer by identifying a panel of DNA methylation markers in bladder tumors that may be predictive of stage.

Methods: Through an IRB approved protocol, non-invasive bladder tumor blocks from the Department of Urology at the University of Southern California were reviewed for DNA methylation analysis. Following DNA extraction from the tumors, methylation levels at select CpG dinucleotides throughout the genome were detected using the Infinium 450K array technology. In addition, invasive bladder tumor DNA methylation data was obtained from The Cancer Genome Atlas (TCGA). Unsupervised clustering using Ward’s method was used to develop a heat map of the most variant probes across tumors. Finally, a multinomial logistic regression model of this data was used to identify differentially methylated CpG sites as predictive markers for normal urothelium, low stage, or high stage tumors.

Results: We obtained 26 normal urothelium, 63 low stage tumors (Ta-T1), and 130 high stage tumors (T2-T4) that were analyzed for DNA methylation markers. We isolated 2,479 candidate markers of differential DNA methylation with average beta value difference between two sample groups being greater than 0.3 (Figure). A panel of 3 DNA methylation markers was found to predict normal urothelium with 81% accuracy, a panel of 6 DNA methylation markers was found to predict low stage tumors with 91% accuracy, and a panel of 15 DNA methylation markers were found to predict high stage tumors with 98% accuracy. Overall, the model is 94% accurate for the 219 samples analyzed.

Conclusions: These preliminary results suggest significant differences in DNA methylation levels exist at specific sites in the human genome for low stage versus high stage BC. Consequently, there is potential to improve clinical understaging utilizing these predictive markers. In the next phase of the study, external validation of these markers will be done on prospectively collected bladder tumors.

Source of Funding: National Cancer Institute
THE DIAGNOSIS OF NON-MUSCLE INVASIVE BLADDER CANCER IS ASSOCIATED WITH SIGNIFICANTLY DECREASED MENTAL BUT NOT PHYSICAL HEALTH RELATED QUALITY OF LIFE

George R. Schade, MD; Brian Winters, MD; Sarah K. Holt, PhD*; John L. Gore, MD; Atreya Dash, MD; Michael P. Porter, MD; Jonathan L. Wright, MD: Seattle, WA

(Presentation to be made by George R. Schade)

Objective: The effect of a new diagnosis of non-muscle invasive bladder cancer (NMIBC) on health related quality of life (HRQoL) is poorly defined. We evaluated the change in HRQoL in patients with a new diagnosis of NMIBC compared to the general population.

Methods: Using the SEER-Medical Health Outcome Study (MHOS) database (1998-2011) with SEER-linkage in 2009, we identified 277 patients diagnosed with NMIBC between initial and follow-up MHOS surveys. NMIBC patients (stage Tis, Ta, and T1) who underwent cystoscopy with biopsy or transurethral resection of bladder tumor(s) for bladder cancer diagnosis were propensity matched 1:5 to non-cancer controls (n=1384). Changes from baseline in the mental component scale (MCS) and physical component scale (PCS) (both derived from SF-36 and VR-12 questionnaires) were compared between NMIBC patients and non-cancer controls with multivariate linear regression analysis. Differences in urinary incontinence (UI) and receipt of treatment for UI on post-diagnosis surveys were evaluated with the χ² test.

Results: At baseline (pre-diagnosis), mean MCS (52.2 vs 51.9, p=0.74) and PCS (39.9 vs 40.1, p=0.8) scores were similar between NMIBC patients and non-cancer controls. On follow-up surveys (post diagnosis), NMIBC patients had a significantly greater mean change in MCS compared to controls (-2.0 (95% CI -3.2 – -0.8) vs. -0.5 (95% CI -1.1 – 0.0), adjusted p=0.044), while mean PCS change was similar between groups (-2.5 (95% CI -3.7 – -1.4) vs. -1.8 (95% CI -2.3 – -1.3), adjusted p=0.27). While there was no difference in the incidence of UI (p=0.8) or difficulty controlling urine (p=0.3) between groups on follow-up surveys, NMIBC patients were more likely to have significant bother from UI (21.1% vs. 10.9%, p=0.04), discuss UI with their physician (59% vs. 36.2%, p=0.0001), and receive treatment for UI (43.8% vs. 22.8%, p=0.0001) vs. non-cancer controls.

Conclusion: The diagnosis of NMIBC is associated with a significant decrease in mental HRQoL among Medicare beneficiaries. Interventions aimed at improving these patients' mental health and providing support around the time of NMIBC diagnosis may be beneficial.

Funding: None
PREOPERATIVE ALBUMIN IS PREDICTIVE OF EARLY POST OPERATIVE MORBIDITY AND MORTALITY IN COMMON UROLOGIC ONCOLOGIC SURGERIES
Ronald J Caras DO, Michael B Lustik MS, Sean Q Kern MD, Joseph Sterbis MD, Leah McMann MD: Honolulu, HI
(Presentation to be made by Dr. Caras)

Introduction: Multiple studies have linked preoperative nutrition status to postoperative outcomes. To date, few of these studies have evaluated urologic patients, and no study has undertaken as comprehensive of an analysis of urologic surgery patients. We used a standardized, national, risk-adjusted surgical database to evaluate the 30-day outcomes of patients undergoing common urologic oncologic procedures as they relate to patient preoperative nutritional status.

Methods: The American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) is a risk-adjusted data collection analyzing preoperative risk factors, demographics, and 30-day postoperative outcomes. From 2005-2012, we identified a total of 17,805 patients who underwent prostatectomy, nephrectomy, partial nephrectomy, cystectomy, or transurethral resection of bladder tumor (TURBT) in which preoperative albumin level was also collected. Hypoalbuminemic patients were compared to those with normal preoperative albumin and 30-day outcomes were evaluated. Logistic regression analyses were used to estimate odds ratios for mortality and complication rates for the above procedures.

Results: Evaluation of the cohort noted significantly increased risk of overall morbidity, serious morbidity, and mortality in the hypoalbuminemic group (P<0.01 for all procedures). Hypoalbuminemia, was associated with a significantly higher 30 day mortality in both major inpatient procedures such as cystectomy, and in outpatient procedures such as TURBT (P<0.01). Hypoalbuminemia was associated with a 6.4% 30 day mortality in the TURBT group compared to 0.6% in those with a normal albumin (P<0.0001). These findings remained significant after adjustment for other risk factors.

Conclusions: The large sample size, standardized data definitions, and quality control measures of the ACS-NSQIP database allow for in depth analysis of subtle but significant differences in outcomes between groups. Serum albumin is a strong predictor of short term postoperative complications in the urologic oncology patient. Increased morbidity and mortality is noted in both major inpatient procedures and minor outpatient procedures. These findings will assist with preoperative surgical counseling.
Objective: Herein we define the best prognostic biomarkers in bilharzial and non-bilharzial related bladder cancer (BBC and NBBC) after radical cystectomy (RC). We also determine the clinico-pathological differences between BBC and NBBC.

Methods: Immunohistochemical (IHC) staining for 14 markers (p53, p21, p27, cyclin E, ki67, COX-2, EGFR, FGF-2, VEGF, Bcl-2, Caspace-3, Bax, ERK, TSP-I) was performed in 315 patients treated with RC. Patients were divided into 2 groups: Group 1 comprised 205 patients (65%) with BBC and group 2 comprised 110 patients (35%) with NBBC. Clinico-pathological differences were compared and markers were correlated to clinical outcome in both groups.

Results: The study included 315 patients (239 males and 76 females) with median age 54 y (range 31–79). There was significant difference in histological types, tumor stage, grade, and architecture between both groups (P < 0.05). BBC presented with lower grade, higher stage, and non-papillary non-urothelial carcinoma. COX-2 expression was the best independent predictor of disease recurrence (HR 1.9, CI 0.99–3.626 and P= 0.05) and cancer specific mortality (HR 2.8, CI 1.155–6.73 and P= 0.023) in BBC. Ki-67 was the only marker associated with disease recurrence in NBBC in Kaplan-Meier survival analyses (HR 4.2, p =.038).

Conclusions: BBC differs pathologically and biologically from NBBC. BBCs present more frequently as low-grade, high stage non-papillary and non-urothelial cancers. Our findings support the need for further evaluation of COX-2-targeted prevention and therapies in bladder cancers developing on top of chronic inflammation. Ki-67 might represent a good prognostic marker regardless to histological type of BC at Western countries, but this should be further studied.

Source of Funding: Egyptian Ministry of Higher Education via the Egyptian Cultural and Educational Bureau (ECEB) in Washington DC.
CLINICO-BIOLOGICAL PROGNOSTIC SCORE FOR PREDICTION OF ONCOLOGICAL OUTCOMES AFTER RADICAL CYSTECTOMY FOR SQUAMOUS CELL CARCINOMA OF THE BLADDER

(Presentation to be made by Dr. Youssef)

Objectives: Clinico–biological prognostic score was correlated to clinical outcomes in patients treated with radical cystectomy (RC) due to squamous cell carcinoma (SCC) of the urinary bladder.

Methods: Immunohistochemistry for 14 biomarkers (p53, p21, p27, cyclin E, ki67, COX–2, EGFR, FGF–2 VEGF, Bcl–2, Caspace–3, Bax, ERK, TSP–I) was performed on tissue microarray sections of 151 RC with pure SCC. The prognostic biomarkers were determined and a 3 risk category molecular score was defined based on number of alterations. A 3 risk category clinical score was defined based on disease free survival (DFS) probabilities estimated by MSKCC post cystectomy nomogram combining 7 clinico–pathological parameters (http://nomograms.mskcc.org/Bladder/PostSurgery.aspx). The sum of 2 scores was used to define unfavorable prognostic score (> 3 prognostic sum) that was correlated to DFS.

Results: The study included 151 patients (98 men and 53 women, mean age 52 years, 122 (81%) associated with bilharziasis). The pathological stage was T2 in 50%, T3 in 38%, T1 and T4 in 6% each; lymph node metastasis in 30.5% and lymphovascular invasion in 16% of patients. Median follow up was 63.2 months. The best prognostic panel of markers included (COX–2, FGF–2, P53, Bax) according to significance in Kaplan–Meier analyses. The marker score was defined as (1 or low risk if no or 1 marker altered, 2 or intermediate risk if 2 markers were altered, and 3 when > 2 markers were altered). The clinical score was defined as (1 or low risk if DFS probability is > 80%, 2 or intermediate risk if DFS is 60–80%, and 3 when DFS < 60%). The poor prognostic score was defined if the sum of 2 scores was > 3). The poor prognostic score was associated with disease recurrence Kaplan Meier analyses (P < 0.001); and was an independent predictor of disease recurrence (HR 3.2, and p=0.02, CI 1.168–8.524)

Conclusions: Biomarkers can help classic clinic–pathological prognostics for prediction of poor outcome after radical cystectomy for SCC. A prognostic score combining clinical and molecular prognostics can be utilized for patient counseling, selection for adjuvant therapies and design of clinical trials.

Source of Funding: Egyptian Ministry of Higher Education via the Egyptian Cultural and Educational Bureau (ECEB) in Washington DC.
THE IMPACT OF AGE AND COMORBIDITY ON LENGTH OF STAY AND COST FOR RADICAL CYSTECTOMY PATIENTS IN WASHINGTON STATE USING TRADITIONAL AND NOVEL STATISTICAL APPROACHES

Khanh N. Pham, M.D., Richard B. Johnston, M.D., Ph.D., Daniel J. Lewinshtein, M.D., and Christopher R. Porter, M.D.: Seattle, WA
(Presentation to be made by Dr. Pham)

Purpose: Radical cystectomy (RC) is the standard of care for patients with muscle-invasive bladder cancer. It has been reported that complications increase with age, comorbid conditions, and the type of urinary diversion offered. Some studies have found that surgeon volume is the predominant factor determining outcome, suggesting that centralization of RC would reduce complications and cost. We hypothesized that increased age, comorbidity, and more complex urinary diversion would predict longer, more costly hospitalizations while increased surgical volume of the surgeon and center would have the opposite effect.

Methods: Prospective computer records from Washington Comprehensive Hospital Reporting System were used to identify patients that had undergone radical cystectomy from 2003–2008. Statistical analysis was performed using Chi-squared, Mann Whitney, linear, and uni/multivariate regression. We then modeled the data for non-nested trends. The model selection procedure was based on the Bayesian Information Criterion. All calculations were done in R version 2.12.2.

Results: A total of 1,014 cases were identified. Older patients received a lower percentage of neobladders and were more likely to have in-hospital mortality. Both Medicare/Medicaid patients and patients with no comorbidities were significantly more likely to have a shorter LOS. Location of surgery or volume of surgeon had no impact on LOS. Age (p=0.001) was the only variable to have a uniform effect on cost. When Bayesian Information Criterion was applied, a Sichel model analysis revealed that high surgeon volume (p =0.049) and comorbidities (p =0.035), including specifically obesity (p =0.049) and COPD (p =0.041), had a significant impact on cost.

Conclusions: Higher institutional volume only trended towards lower costs of stay but did not predict reduced mortality. Higher individual surgeon volume reduced the average cost per procedure. Regression analysis only comorbidity had no uniform effect on cost. However, using advanced modeling techniques preoperative comorbidities had a significant impact on cost.
Purpose: Ileal conduit (IC) and orthotopic neobladder (NB) remain two of the most commonly performed urinary diversions. To date, the literature suggests that NB is associated with a higher complication rate than ileal conduit (IC). However, these studies are generally from single center or retrospective institutional databases. Using the NSQIP database, we sought to determine demographic features of patients undergoing NB from a nationwide mix of high and low volume practices from community and academic settings. We also sought to determine intraoperative and postoperative characteristics among patients receiving NB when compared to IC.

Materials and Methods: The National Surgical Quality Improvement Program (NSQIP) is a prospective quality management initiative that collects clinical information, intraoperative data and complications from a wide variety of surgical procedures. From 2005-2012, we retrospectively identified 3120 patients who underwent radical cystectomy for bladder cancer. We assessed differences in patient demographics, intraoperative variables, and postoperative complications between IC and NB at the time of cystectomy. We first conducted a univariate analysis to compare the covariate for subjects with NB vs. IC, using Pearson’s Chi-square test for categorical variables, and two-sample t test for continuous variables. We then conducted a multivariable logistic regression analysis to identify covariates that jointly significantly predicts NB from IC.

Results: 456 (15%) of cystectomy patients underwent NB and 2664 (85%) underwent an IC. Patients receiving a NB were more likely to be Caucasian (88 vs 83%, p <0.001), male (86 vs 72%, p=0.0021), young (62 v 68 years, p<0.001) and were more likely to have an ASA score of 1 (38 vs 24%, p<0.001) when compared to patients undergoing IC. There were no statistically significant differences with respect to superficial or deep infections, renal insufficiency, venous thrombotic or cardiovascular events between patients undergoing NB vs IC. Patients undergoing NB were less likely develop pneumonia or require transfusions, but were more likely to develop urine infections (13 v 9%, p=0.003). NB patients had longer operative times (404 vs 353 mins, p<0.0001), but shorter hospital stays (10 v 11 days). There were no differences in reoperative rates between the two cohorts in the univariable analysis. However, with the multivariable analysis, patients receiving an IC were more likely to have a reoperation when compared to NB (p<0.01). Patients undergoing NB were more likely to be readmitted (22 vs 18%), although this did not achieve statistical significance (p=0.09).

Conclusions: Patients who undergo a NB are more likely to be white and male, of younger age, and have fewer comorbidities. At the time of surgery, they have longer operative times, but are less likely to require transfusions. Despite their younger age and improved health, they are more likely to develop infections of the urinary tract and trend towards increased readmissions. Patients with NB were no more likely to suffer a PE or DVT that required therapy, or experience progressive renal insufficiency. Also, NB patients were less likely to return to the OR on multivariable analysis when compared to IC. These data are applicable to all urologists when counseling patients about the risks and benefits of an IC versus NB.
COMPARISON OF COMPLICATIONS AND LENGTH OF HOSPITAL STAY IN PATIENTS GREATER THAN 75 THAT UNDERWENT RADICAL CYSTECTOMY: A MULTI-INSTITUTION ANALYSIS


(Presentation to be made by Darshan P. Patel)

Purpose: Radical cystectomy is the standard treatment for muscle invasive bladder cancer. Elderly patients undergoing this procedure often develop greater morbidity and higher mortality than younger patients. The purpose of this study was to evaluate the affect of length of stay on complications following radical cystectomy in patient's ≥75 years old.

Methods: 212 patients between 75-95 yrs (median: 79 yrs) were identified from the University of Utah (Group 1, n=91) and Central Hospital of Bolzano (Group 2, n=212). Data was gathered retrospectively in Group 1 and prospectively in Group 2. BMI, co-morbidity, hospital length of stay, complications, and overall mortality were assessed. Complications were categorized using the Clavien-Dindo Classification system.

Results: The median hospital stay was 9 (IQR: 7.5-13) and 22 (IQR: 18-30) days in Group 1 and Group 2, respectively (p< 0.001). The occurrence of ≥ Grade III Clavien-Dindo complications was similar and not statistically significant between the two groups (23.1% in Group 1 and 24.8% in Group 2). Additionally, there was no difference in the 30 and 90 day mortality post-operatively (14.3%, 18.7% in Group 1, respectively; 6.6%, 14.0% in Group 2, respectively). The three-year overall survival was 44% in Group 1 and 29.8% in Group 2 but not statistically different (p=0.21).

Discussion: We evaluated a large series of elderly (≥75 years old) patients undergoing radical cystectomy at two tertiary institutions with a significant difference in hospital length of stay. Our results demonstrate that longer length of stay for elderly patients undergoing radical cystectomy has no affect on the rate of ≥ Grade III complications and 30 day, 90 day, and overall mortality.

Source of Funding: None
ANALYSIS OF JP DRAIN OUTPUT FOLLOWING RADICAL CYSTECTOMY: VOLUME AND NUTRITION LOSS

Kamran Movassaghi, MD, Hamed Ahmadi, MD, Siamak Daneshmand, MD, Hooman Djaladat, MD (To be presented by Dr. Djaladat)

Objectives: Jackson-Pratt (JP) drains are commonly placed in post cystectomy patients to access for post-surgical leaks and help drain excess fluid. Usually they are prophylactic and removed between two to three weeks post-surgery. We sought to investigate the fluid and nutritional caloric energy loss through the JP drain in our cohort of cystectomy patients.

Methods: 103 cystectomy patients were prospectively followed between November 2013 and May 2014. JP drain fluid was collected and sent out for laboratory analysis including full lipid, protein, and glucose profile on third post-surgical day (POD 3).

Results: Average JP fluid output and nutritional energy loss on POD 3 was 551 ml and 77.89 calories; respectively. Protein loss was highest in JP fluid, accounting for an average of 95.24 calories. (Table 1) JP drains were removed on POD 22, on average, in this cohort of patients. Dehydration was present in 12 patients (11%) within the first 30 days after the surgery. JP fluid output was not significantly different between patients with or without dehydration.

Conclusion: The overall volume loss through the JP drain is significant. Although JP fluid loss on POD 3 does not seem to correlate with dehydration in current study, larger study is required to assess the effect. Also, despite relatively low calorie loss through the JP drain, protein loss is prominent and might need special attention in post-surgery diet and nutrition plan.

Source of Funding: None

Table 1. Details of JP fluid analysis on POD 3

<table>
<thead>
<tr>
<th>Source</th>
<th>Grams Lost</th>
<th>Calories Lost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbohydrate (glucose)</td>
<td>0.47 g</td>
<td>1.88 C</td>
</tr>
<tr>
<td>Protein</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Albumin</td>
<td>9.04 g</td>
<td>36.16 C</td>
</tr>
<tr>
<td>Total Protein</td>
<td>14.77 g</td>
<td>59.06 C</td>
</tr>
<tr>
<td>Fats</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Triglyceride</td>
<td>.22 g</td>
<td>1.98 C</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>.19 g</td>
<td>1.71 C</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>77.89</td>
</tr>
</tbody>
</table>
INCISIONAL HERNIA IN PATIENTS FOLLOWING OPEN RADICAL CYSTECTOMY

Kamran Movassaghi, M.S., Anh Huy Nguyen, B.S., Hamed Ahmadi, M.D., Swar Shah, M.D., Gus Miranda, M.S., Jie Cai, M.S., James Fernandez, M.D., Vinay Duddalwar, M.D., Anne Schuckman, M.D., Siamak Daneshmand, M.D., Hooman Djaladat, M.D.: Los Angeles, CA
(Presentation to be made by Dr. Djaladat)

Objectives: Incisional hernia (IH) is a common complication following radical cystectomy (RC). The incidence varies depending on length of follow-up and method of diagnosis. We sought to investigate both clinical and radiological evidence for IH and associated risk factors in a large cohort of patients who underwent open RC for bladder cancer.

Methods: Using our IRB approved prospective database, we identified 1,101 patients who underwent RC between 2003-2013 for primary bladder cancer. 670 of these patients had complete clinical and radiographic follow up for a median of 18 (range 1-128) months. IH was defined as any fascial defect and/or protrusion of abdominal contents through the abdominal incision. Postoperative CT scans were reviewed and confirmed by an expert radiologist. A multivariate Cox regression model was used to identify independent predictors of IH.

Results: IH was identified in 125/670 (18.7%) patients. The average age of the cohort was 68.6 years (+/- 11.7). 111/125 (88.8%) patients were male. The mean BMI was 27.3 (13.5-50.3). Median time from cystectomy to IH diagnosis was 13 months (range 1-104). The hernia defect size was available in 98/125 patients with a mean of 2.4cm (range 0.2-19 cm). 51/125 (41%) had both clinical and radiographic evidence of the defect of whom, 34/125 (27%) were symptomatic with bulge and pain. 48/125 (38%) patients underwent surgical repair of IH. Patient characteristics are summarized in table 1. A multivariate cox regression model revealed a significant association between age, gender, estimated blood loss (significant trend), urinary diversion (orthotopic vs. heterotopic), and length of hospital stay and IH (table 2).

Conclusion: Incisional hernia is a common complication seen in 19% of patients undergoing cystectomy with a median presentation of 1 year after surgery. Age, male sex, increased EBL and lengthy hospital stay are among factors associated with higher risk of incisional hernia.

Table 1. Patient Characteristics and Univariate Analysis

<table>
<thead>
<tr>
<th>Category</th>
<th>No IH</th>
<th>IH</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Pt</td>
<td>549</td>
<td>225</td>
<td></td>
</tr>
<tr>
<td>Median Age</td>
<td>71 (23-95)</td>
<td>67 (40-89)</td>
<td>0.0256</td>
</tr>
<tr>
<td>Gender (M/F)</td>
<td>Female</td>
<td>Male</td>
<td></td>
</tr>
<tr>
<td>Median BMI</td>
<td>26.8 (13.5-48.8)</td>
<td>27.6 (13.9-50.3)</td>
<td>0.0192</td>
</tr>
<tr>
<td>Median ml EBL</td>
<td>700 (50-6500)</td>
<td>900 (250-3200)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Median hr operative time</td>
<td>5.8 (2.7-12.3)</td>
<td>6 (3.8-8.3)</td>
<td>0.1182</td>
</tr>
<tr>
<td>Median day length of stay</td>
<td>7 (3-62)</td>
<td>8 (3-45)</td>
<td>0.0068</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>≤ 30 426</td>
<td>86</td>
<td>0.0450</td>
</tr>
<tr>
<td></td>
<td>&gt;30   118</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td>95 (20.6)</td>
<td>22 (18.8)</td>
<td>0.7963</td>
</tr>
<tr>
<td>Previous Abdominal Surgery</td>
<td>57 (40.7)</td>
<td>9 (75)</td>
<td>0.0116</td>
</tr>
<tr>
<td>CCI (&gt;1)</td>
<td>279 (51.5)</td>
<td>57 (46.0)</td>
<td>0.2753</td>
</tr>
<tr>
<td>Albumin (&lt;3.5)</td>
<td>40 (12.5)</td>
<td>11 (10.3)</td>
<td>0.6690</td>
</tr>
<tr>
<td>Urinary Diversion</td>
<td>Orthotopic</td>
<td>319 (58.5)</td>
<td>311 (88.8)</td>
</tr>
<tr>
<td></td>
<td>Non-Orthotopic</td>
<td>226 (41.5)</td>
<td>34 (11.2)</td>
</tr>
<tr>
<td>Perioperative Chemotherapy</td>
<td>104 (19.0)</td>
<td>30 (8.6)</td>
<td>0.0022</td>
</tr>
<tr>
<td>Early Complications</td>
<td>336 (61.7)</td>
<td>72 (17.6)</td>
<td>0.4143</td>
</tr>
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</table>

Table 2. Cox Proportional Hazards Regression of Clinical Characteristics Associated with IH

<table>
<thead>
<tr>
<th>Category</th>
<th>Hazard Ratio</th>
<th>95% CI</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (&lt;60 years)</td>
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Source of Funding: None
Objectives: Failure to thrive (FTT) is one of the most common reasons patients are readmitted after radical cystectomy. In this study, we evaluate the predictive factors associated with this reason for readmission.

Materials and Methods: Our institutional cystectomy dataset was queried for patients who underwent cystectomy from 1998 to 2013 (n=643). Of these, 22.9% (n=144) were readmitted to our institution within 90 days of discharge. Of these readmissions, 25.6% (n=37) were admitted with the primary diagnosis of FTT (which includes dehydration, anorexia, weakness, etc). The remaining 107 patients that were admitted for other reasons were excluded. Institutional review board approval was obtained. To determine the predictors of FTT, a logistic regression analysis was performed which included terms for age, sex, diversion type, pathologic stage and change in postoperative CO2 levels, which was calculated by subtracting the day of discharge CO2 from the preoperative CO2 level. In the regression model, change in CO2 was dichotomized (a drop in CO2 >= 6 mmol/L versus all others).

Results: On univariate analysis, two variables were associated with hospital readmission for FTT: age greater than 75 years and mean change in CO2. Approximately 11.2% of patients older than 75 years were readmitted for FTT compared to 4.1% of patients under the age of 75 (p=0.001). The mean change in CO2 for patients readmitted for FTT was -2.4 mmol/L compared to -0.8mmol/L among patients that were not readmitted (p=0.02). There were no differences with respect to surgical approach (robotic vs. open), gender, type of diversion (conduit vs continent), total operative time, body mass index, total lymph node yield, lymph node positivity, estimated blood loss, total number of units of blood transfused, American Society of Anesthesiology score, or pathologic stage. On multivariable logistic regression analysis, both age greater than 75 years (OR 3.35; 95% CI: 1.51-7.39; p=0.003) and a drop in CO2 >= 6mmol/L (OR 3.31; 95% CI: 1.44-7.58; p=0.005) retained their significant association with readmission for FTT. An interaction term was included to determine the impact of age on change in CO2, which was nonsignificant (p=0.98). Notably, continent forms of diversion were also associated with readmission for failure to thrive (OR 2.39; 95% CI: 1.01-5.72; p=0.049).

Conclusions: Among patients undergoing radical cystectomy, the risk of readmission for FTT is highest among patients older than 75 years who undergo continent forms of diversion and experience a drop in CO2 greater than 6mmol/L.

Source of Funding: None
SAFETY OF POST-OPERATIVE ANTICOAGULATION AFTER TRANSURETHRAL RESECTION OF BLADDER TUMORS
Raeann H. Macalma, M.D., Brock O'Neil, M.D., Angela P. Presson, PhD. M.S.*, Robert A. Stephenson, M.D., Andrew W. Southwick, M.D., William Lowrance, M.D.; Salt Lake City, UT (Presentation to be made by Dr. Macalma)

Background: Recent population-based data suggest thromboembolic events after urologic procedures occur at a surprisingly similar rate for transurethral resection of bladder tumor (TURBT), radical prostatectomy, and radical nephrectomy. Authors from multiple studies have encouraged the use of chemoprophylaxis for patients who undergo prostatectomy and other major urologic procedures. However, none have evaluated the routine use of prophylaxis for patients undergoing TURBT.

Objective: We sought to compare the rates of bleeding and other complications in the peri-operative period after TURBT between patients taking anticoagulation medications and those not taking anticoagulation.

Methods: We performed a retrospective review of 200 patients who underwent TURBT over 3.5 years (2/9/10-8/13/13), comparing outcomes of peri-operative bleeding and other complication rates in patients who were already receiving anticoagulation for reasons unrelated to the bladder tumor, such as atrial fibrillation, previous thromboembolic event, or mechanical valve, to the rates in those who were not receiving peri-operative anticoagulation medications. Ninety day complication rates were analyzed in both univariate and logistic regression models controlling for age and modified Charleston Comorbidity score. Additionally, we evaluated complications with patient age, size of bladder tumor resected and level of training of the assisting resident. Univariate analysis of complications was conducted with a Fisher's exact or chi-squared test for categorical variables, and a t-test or Wilcoxon rank sum test for continuous variables. Significance was evaluated at the 0.05 level and all tests were two-tailed.

Results: Bleeding complications occurred in 22% and 23% of the 32 patients receiving anticoagulation therapy within 30 and 90 days post-TURBT, respectively. Comparatively, bleeding complications occurred in 11% and 13% of the 162 patients not receiving anticoagulation within 30 and 90 days post-TURBT (90 day p-value = 0.17). Other surgical complications occurred in 28% and 39% of the 32 patients taking anticoagulation medication within 30 and 90 days post-TURBT. Other surgical complications occurred in 23% and 31% of the 162 patients not taking anticoagulation medication within 30 and 90 days post-TURBT (90 day p-value = 0.42). We did not identify a statistically significant difference between the rates of bleeding and/or other post-operative complications and the patient’s age, size of bladder tumor resected or level of training of the resident involved in the case.

Conclusion: While bleeding and other complication rates were higher in patients receiving post-operative anticoagulation therapy compared to patients who were not, the differences were not statistically significant. Furthermore, in a retrospective setting, it is difficult to know whether a trend in higher rates is due to the patients' condition or the anticoagulation therapy itself. Additional studies are needed to further evaluate the utility of anticoagulation prophylaxis in the post-TURBT setting.

Source of Funding: None
RESTRICTIVE TRANSFUSION USE IN RADICAL CYSTECTOMY DOES NOT INCREASE 90 DAY COMPLICATION RATES
Sumeet Syan-Bhanvadia, M.D. Siamak Daneshmand, M.D. Siri Drangsholt, MS Jie Cai Gus Miranda: Los Angeles, CA

Purpose: Data suggests that perioperative blood transfusion (PBT) at time of radical cystectomy (RC) is associated with poorer overall and oncologic outcomes. By refining our RC technique and employing a judicious approach to perioperative use of blood products we have minimized PBT rates as previously described. Now, we assess the impact of this approach on short-term complication rates.

Materials and Methods: We identified 104 consecutive patients who underwent RC from April 2010 to December 2012 by a single surgeon who employs a restrictive approach to PBT. These patients were matched to a cohort who underwent RC from 2003 to 2010. This was defined as Era 1; the former as Era 2. Patients were matched for age, sex, co-morbidities, clinical stage and neoadjuvant chemotherapy status (n=87 in each arm). PBT was defined as allogenic blood cell transfusion during RC or hospital stay. Retrospective review of perioperative data and 90 day complications using Clavien-Dindo classification was performed. Student t-test and linear as well as stepwise regression modeling were used to compare outcomes.

Results: A tissue sealant device and hemostatic agents were used intra-operatively in all Era 2 patients. Median EBL was lower in Era 2 at 400 mL (range=150–1200) vs. 1000 mL (500–4300) (p<0.0001). Mean operative time was shorter in Era 2 at 319 min (183–509) vs. 355 min (193–682) in Era 1, p=0.001. Median preoperative, immediate post-operative and discharge hematocrits were higher in Era 1 at 38.5, 34.4 and 33.1 compared to 29.7, 28.7 and 28.1, respectively, in Era 2 (p<0.0001 for all). However, by three weeks post-operatively there was no difference in median hematocrit between eras (35.4 versus 34.3, p=0.2). The rate of PBT was 92% in Era 1 compared to 31% in Era 2, with a mean of 4 units pRBC (0–24) transfused in Era 1 compared to 0.6 (0–21) units in Era 2 (p<0.0001). Ninety day complication rates were similar at 28.7% and 30.46% (p>0.05). Overall, there were no differences in the incidence of low (37.9% versus 41.4%) or high grade (19.5% in each era) complications between eras (p=0.88). Categorically there were no differences in rates of cardiac complications (10/3% versus 11.5%, p=1). Readmission rates were similar at 11.5% and 10.9% (p>0.05). On multivariable logistic regression predictors of PBT across all eras were being in Era 2 versus 1 (OR=0.003, 95% CI <0.001-0.02), age (OR=1.07, 95% CI 1.02–1.12), female gender (OR=9.6, 95% CI 1.72–53.37), and preoperative hematocrit (OR=0.86, 95% CI 0.74–0.92) (all p<0.05). Neoadjuvant chemotherapy status was not a predictor.

Conclusions: Reducing intraoperative blood loss coupled with a restrictive transfusion approach can safely minimize PBT in RC without increasing the rate of perioperative complications overall or specifically cardiovascular complications.
POST-RECURRANCE SURVIVAL IN BLADDER CANCER FOLLOWING RADICAL CYSTECTOMY BASED ON METASTATIC SITE
Anirban P. Mitra, M.D., Ph.D., David I. Quinn, M.D., Ph.D.*, Eila C. Skinner, M.D., Tanya B. Dorff, M.D.*, Anne K. Schuckman, M.D., Siamak Daneshmand, M.D.: Los Angeles, CA; Stanford, CA (Presentation to be made by Dr. Mitra)

Purpose: Disease recurrence following radical cystectomy for bladder cancer is not uncommon and fatal in over 95% of patients. Recent studies have characterized outcomes following post-cystectomy recurrence. However, there are no substantial series evaluating differential outcomes of patients based on site of distant recurrence. This study used a large institutional cohort to identify prognosticators for bladder cancer post-recurrence survival (PRS) based on the sites of distant metastasis.

Materials and Methods: The population of 2,029 bladder cancer patients treated at our institution between 1971-2005 was reviewed to identify those who recurred following radical cystectomy with curative intent. Minimum 2-year post-recurrence follow-up was required if patient was alive. Patients with urethral or upper tract primaries and distant metastasis at diagnosis were excluded. Associations were computed using $\chi^2$ tests and log-rank statistics for survival data.

Results: 447 (22% of total) patients met the study criteria, of which 430 patients had detailed documentation of recurrence sites. 25 (6% of all recurred) patients received neoadjuvant chemotherapy. 80 (19%) patients had only local soft tissue recurrence; median time to recurrence (TTR) and PRS were 12.5 and 8 months, respectively. 86 (20%), 134 (31%), 16 (4%) and 177 (41%) patients presented with metastases to liver, bone, brain and lung, respectively; of these, 36, 79, 8 and 55 patients metastasized exclusively to these sites. Median TTRs for these sites were 13.8, 11.7, 17.9 and 12.9 months, respectively. Compared to local recurrence-only, median PRS was shorter for patients with liver (3.4 months, $p<0.001$) and bone (4.9 months, $p=0.001$) metastases, but was not significantly different to those with brain (4.6 months, $p=0.31$) and lung (7.3 months, $p=0.44$) metastases. Advanced pathological stage was associated with shorter PRS for patients with liver metastasis ($p=0.01$), but was not associated with PRS for other sites. Tumor upstaging was associated with poorer PRS for patients with brain metastasis ($p=0.012$). Lymph node density >10% was associated with poor PRS for patients with liver and lung metastases (both, $p<0.001$). Patients with lung metastasis also had poorer PRS if they recurred within one year post-cystectomy ($p=0.002$) or presented with additional sites of distant metastases ($p=0.001$). Administration of salvage chemotherapy improved PRS for patients with liver, bone, lung (all, $p<0.001$) and brain ($p=0.012$) metastases.

Conclusions: PRS outcomes may vary depending on the sites of distant metastasis, although overall prognosis following distant recurrence of bladder cancer following cystectomy is poor. Most patients with distant recurrence present with multiple sites of metastases. Salvage chemotherapy may improve post-recurrence outcomes, although further studies are needed to exclude selection bias.

Source of Funding: None
TRENDS IN URINARY DIVERSION FOLLOWING RADICAL CYSTECTOMY: EVOLVING EXPERIENCE OF A SINGLE INSTITUTION OVER 25 YEARS
Anirban P. Mitra, MD, PhD, Anne K. Schuckman, MD, Eila C. Skinner, MD, Gary Lieskovsky, MD, Siamak Daneshmand, MD: Los Angeles, CA; Stanford, CA (Presentation to be made by Dr. Mitra)

Purpose: Orthotopic neobladder (ONB) reconstruction is arguably considered the current gold standard for urinary diversion following radical cystectomy for bladder cancer. While relative and absolute contraindications for orthotopic diversion generally exist, these may vary between centers depending on experience and philosophy. This study examined trends in urinary diversion, with associated patient/tumor characteristics and oncological outcomes in a large institutional cohort over a period of 25 years.

Materials and Methods: Data on patients who underwent open radical cystectomy for bladder cancer with urinary diversion at our institution between 1986 and 2010 were retrospectively reviewed. Time-dependent demographic, tumor-, diversion-, and outcome-related metrics were analyzed.

Results: 1,754 patients were identified (median age, 68 years; 79% males; median follow-up, 9 years). Median number of patients undergoing cystectomy with diversion annually was 66 (range, 45–125). Patients undergoing ONB increased from 47.5% during 1986–1990 to 74.1% during 2006–2010; ileal conduits increased from 8.5% to 21.7%, and continent cutaneous diversions decreased from 44% to 4.2% during the same eras (p<0.001). Over the 25-year period, median patient age increased from 65 years to 70 years; patients with ASA score ≥3 increased from 29.6% to 75.9% (both, p<0.001). Proportion of patients with extravesical disease increased from 20.2% to 23.5%, although this was not statistically significant (p=0.22). Of all patients undergoing ONB (n=1,299), 59.8% had ≤pT2N0M0, 15.3% had pT3N0M0, 3.2% had pT4N0M0, and 21.7% had pTanyN1–3M0 disease. By multivariable analysis, age <70 years (p<0.001), histologically benign urethral margin on frozen section (p<0.001), and negative soft-tissue surgical margins (p=0.046) were associated with higher likelihood of undergoing ONB. Gender, ASA score, serum creatinine levels, and pathological stage were not associated with likelihood of ONB by this analysis (p≥0.21). 5-year cancer-specific and overall survival probabilities for patients with ONB were 71% and 58%, respectively. Corresponding probabilities for patients with ileal conduits and continent cutaneous diversions were 61%/63% and 34%/53%, respectively. By multivariable analysis, pathological stage was associated with cancer-specific and overall survival (both, p<0.001), but type of diversion had no associations with outcomes (p=0.82, 0.49, respectively).

Conclusions: Since 1986, there has been an increase in ONB reconstruction with a concomitant marked decrease in continent cutaneous diversions and increase in ileal conduits at our institution. This has been despite recent patients being significantly older with more comorbidities at presentation. Our current institutional philosophy is to consider every patient undergoing cystectomy for ONB, except for well-established contraindications related to oncologic, metabolic and/or functional status.

Source of Funding: None
MORBIDITY ASSOCIATED WITH ROBOTIC CYSTOPROSTATECTOMY: INITIAL EXPERIENCE

(Presentation to be made by Dr. Corman)

Purpose: Robotic-assisted laparoscopic radical cystectomy (RARC) has emerged as an accepted technique for the management of muscle invasive bladder cancer. Selection of this surgical approach is based upon a perception of equivalent oncologic outcomes when compared to open surgical techniques as well decreased intra-operative blood loss, earlier hospital discharge, improved postoperative analgesia, and a potential decrease in peri-operative complications. Given the recent focus on robotic surgical learning curves, here we evaluate peri-operative morbidity in an initial series of 30 RARCs performed in a center that has an established robotic prostatectomy program (>2,000 cases).

Methods: A review of a surgical database of the first 30 consecutive patients that underwent RARC at our institution was performed. All reconstructions were performed ex-vivo (ileal conduit vs. continent cutaneous diversion vs ileal neobladder). The Clavien-Dindo Classification system was utilized to define and categorize peri-operative morbidity.

Results: The 30 patients that underwent RARC had a median age of 68 years (range 45-81) and median BMI of 28 (range 22-39). Median blood loss was 250 ml (range 50-1,000), robotic operating time 213 min (range 162-288), and length of hospital stay 7 days (range 4-19). In addition, the median number of lymph nodes extracted was 11 (range 1-25), time to regular diet 6 days (range 4-16), and morphine equivalent consumption 206 mg (range 52-795). Half of patients (15/30) had one or more complications of any grade within 30 days of surgery, for a total of 37 complications. Specifically, 1 patient experienced a Grade IV complication (wound dehiscence at neobladder incision), 1 had a Grade III complication (pyelonephritis requiring readmission), and the remainder experienced Grade I or II complications [i.e., blood transfusion (1), post-operative UTI (4), ileus (8), delirium (1), vertigo (1)]. There were no peri-operative deaths within 30 days of surgery.

Conclusions: Similar to conventional open cystectomy, RARC is associated with significant morbidity, even at a center with extensive experience in robotic oncologic surgery. As RARC emerges as an accepted extirpative procedure in the management of muscle invasive bladder, accurate reporting of complications is crucial for the critical assessment of this technique.
ILEAL T-POUCH AS A BAILOUT OPTION FOR CONTINENT CUTANEOUS URINARY DIVERSION IN ADULTS WHEN THE RIGHT COLON IS UNAVAILABLE
Darshan P. Patel, B.S., William O. Brant, M.D., James M. Hotaling M.D., M.S., Jeremy B. Myers, M.D.: Salt Lake City, UT
(Presentation to be made by Darshan Patel)

Objectives: The right colon pouch reservoir is known for its reliability in patients requiring urinary diversion and desiring a continent catheterizable pouch. In some cases, however, the right colon may not be available or viable for use in reservoir formation. We describe our experience with the use of an ileal T-pouch as a bailout option in continent cutaneous urinary diversion in adults.

Management/Outcomes: Two adult urinary diversions using an ileal T-pouch were performed when the right colon was unavailable or unsuitable for use. Patient 1 was a 64-year-old female with history of endometrial cancer s/p hysterectomy and vaginectomy and colon cancer s/p right colectomy who developed vesicovaginal fistula and urinary incontinence. She previously had 2 slings placed that failed and opted for urinary diversion given her devastated bladder outlet. Her history of a right colectomy eliminated the possibility of a right colon reservoir. Patient 2 was a 69-year-old female with history of endometrial cancer s/p hysterectomy and adjuvant radiotherapy. She developed a vesicovaginal fistula, which did not improve with hyperbaric oxygen therapy, and total urinary incontinence s/p pubovaginal sling placement at the time of her hysterectomy. She elected for continent diversion. Intra-operatively, it was discovered her terminal ileum was adhesed in the pelvis due to the extent of radiation injury and was unusable for reservoir formation. In these 2 patients, the ileal T-pouch serosal lined extramural channel was created as the continence mechanism and the efferent limb for catheterization from the abdominal wall. The ureters were implanted into the pouch as a nipple valve in 1 patient to prevent reflux and in a refluxing open anastomosis in another due to concern of radiation injury. Both patients are catheterizing well without significant leak from the channel beyond a small amount immediately after catheterization. There have been no issues with catheterization or stenosis. The patient with radiation injury has developed high-grade stenosis of her right ureter, related to her pelvic radiation.

Discussion: Our short-term experience demonstrates acceptable outcomes for ileal T-pouch in creation of a continent catheterizable pouch as an alternative to right colon pouch, when the right colon is not viable or is absent from prior surgery. Surgeons that routinely perform continent catheterizable pouch creation should have some alternative to the right colon if it is not viable or absent.

Source of Funding: This project was supported in part by a generous reconstructive urology educational grant from American Medical Systems, Inc., Minnetonka, MN.
PULMONARY AND HEMODYNAMIC EFFECTS ASSOCIATED WITH THE STEEP TREDELENBURG POSITION DURING ROBOTIC SURGERY IN PATIENTS WITH BLADDER CANCER
Prashoban J Bremjit BS*, Sarah K Holt PhD, Brian R Winters MD, Jonathan D Harper MD, Jonathan L Wright MD, MS.: Seattle, WA (Presentation to be made by Dr. Winters)

Introduction: Robotic-assisted radical cystectomy (RARC) is increasingly utilized in the management of bladder cancer. Prior studies have demonstrated prolonged use of the steep Trendelenburg position in other procedures has resulted in significant respiratory and hemodynamic changes including decreased lung compliance and increased cerebral perfusion pressure. Such effects have not been well described in patients with bladder cancer, who often present at lower levels of pulmonary and cardiovascular functional status.

Methods: Consecutive patients undergoing RARC were identified and intraoperative parameters recorded. Pulmonary and hemodynamic data including end-tidal carbon dioxide tension (EtCO2), peak inspiratory pressure (PIP), mean arterial pressure (MAP), heart rate, and arterial blood gas data were collected and tracked over multiple time points. These variables were then compared between two time points: first with the patient in the supine position, and then just prior to the patient being taken out of Trendelenburg. Multivariate linear regression was then used to determine if patient demographics, medical history, and tumor characteristics were predictive of respiratory and hemodynamic levels.

Results: We studied 59 patients with a mean age of 63.3 years at the time of surgery. Significant elevations were seen in mean EtCO2, PIP, and MAP between the supine and Trendelenburg positions. EtCO2 increased from 30.8 mmHg to 36.5 mmHg (p<0.001), PIP from 21.7 mmHg to 33.1 mmHg (p<0.001), and MAP from 71.6 mmHg to 86.5 mmHg. The presence of existing pulmonary disease was strongly associated with higher peak EtCO2 values (p<0.001). Both female gender (p=0.005) and obesity (p=0.05) were found to be significantly associated with higher PIP. Increased age was found to be a predictor for increased MAP (p=0.03). Non-smokers were associated with greater peak PIP (p=0.03) and change in PIP (p=0.04), but both failed to reach significance after adjusting for gender and BMI. Neoadjuvant chemotherapy was associated with higher EtCO2 levels (p=0.05), while higher tumor stage was associated with significantly higher MAP (p=0.02).

Conclusions: Prolonged positioning in steep Trendelenburg during RARC was associated with the expected changes in respiratory homeostasis and hemodynamics. However, all variables remained within clinically allowable ranges. Obesity, female gender and known pulmonary disease were associated with changes in pulmonary and hemodynamic factors. These data can help to identify patients at greatest risk of adverse consequence of steep Trendelenburg during RARC.

Source of Funding: None
PECOMA OF THE URINARY BLADDER TREATED WITH A ROBOTIC APPROACH: A CASE REPORT AND CLINICOPATHOLOGICAL REVIEW OF THE LITERATURE

Daniel E. Schneider M.D., Alan H. Bryce M.D., Melissa L. Stanton M.D., Paul E. Andrews M.D.
(Presentation to be made by Dr. Schneider)

Introduction: Perivascular epithelioid cell tumors (PEComas) comprise a family of tumors that include angiomyolipomas, clear cell tumors of the lung and lymphangioleiomyomatosis. These tumors did not receive a formal definition by the WHO until 2002. There have been multiple reports of these tumors afflicting a variety of visceral organs. However, there have only been 17 reported cases of urinary bladder involvement in the English Literature. Although the majority of these tumors have a benign course, there have been reports of metastasis and death. We report a case of a PEComa in a 19 year old girl, and the second case treated with robotic approach. We also summarize the available literature on the clinicopathological characteristics of PEComas of the urinary bladder and treatment.

Material and Methods: A comprehensive review of the literature was completed utilizing MESH terms, perivascular and epithelioid and/or cell and bladder and/or vesicular yielded a total of 19 cases two of which were excluded because of a gross lack of clinical information. A clinicopathological analysis was completed and outcomes assessed. In regards to the present case histological, immunohistochemical and procedural notes summarized and intraoperative photos included.

Case: A 19 year old presented with a 1 month history of left lower quadrant pain, CT imaging would demonstrated a 3.0 cm enhancing intramural mass just left of the dome of her bladder with no lymph nodal involvement and no enhancement of the urachal ligament. Outside transurethral resection was initially read as invasive transitional cell cancer. On further review the tumor demonstrated a delicate vascular stroma with nested tumor cells with epithelioid and spindled components. The tumor had a low mitotic rate, scant necrosis, no lymphovascular invasion (LVI) and no nuclear atypia. Additional immunohistochemical stains were positive for HMB 45 which is most consistent with a PEComa. The patient subsequently underwent a robotic assisted partial cystectomy. The final pathology was consistent with a PEComa with negative margins and low malignant potential based on histological features. The patient had no intra or postoperative complications. The patient remains disease free approximately 3 months after her procedure with no sequelae.

Conclusion: PEComas are a rare entity in the urinary bladder that typically afflicts patients in their thirties, the presenting complaint and location in the urinary bladder is random. PEComas have unique characteristics and immunohistochemical markers including HMB 45. A malignant course can be predicted by histological features. This is second reported case of a PEComa managed with the robotic platform.
BLADDER CANCER CELL LINES AS A TOOL FOR IDENTIFICATION OF NOVEL DRUGS FOR TREATMENT AND PREDICTION OF PATIENT RESPONSE

James E. Korkola, Catie Grasso, Trevor Levin, Moqing Liu, Tiera Liby, Jeff LaRochelle, Christopher Amling, Joe W. Gray, Theresa M. Koppie

Introduction: Treatment options for patients with metastatic bladder cancer have remained unchanged for the past 20 years, with no new therapeutic agents introduced during that time. Thus, there is an urgent unmet need to introduce new targeted and chemotherapeutic agents that can be deployed to improve outcomes in bladder cancer patients with advanced disease. Furthermore, there is a need to identify which existing (or novel) therapeutics are most likely to provide clinical benefit to specific patients via so-called precision medicine. Here we describe a panel of well-characterized bladder cancer cell lines that capture much of the clinical heterogeneity observed that we have deployed for high-throughput drug screening.

Materials and Methods: We collected a panel of 33 bladder cancer cell lines that have been characterized at the molecular level for gene expression by RNAseq and assessed for phenotypic markers by immunofluorescence. We performed drug screening in these lines using traditional chemotherapeutic agents (cisplatin, gemcitabine, mitomycin C) and targeted agents (EGFR, PI3K-mTOR, and FGFR inhibitors) to determine drug response. Cell lines were dichotomized and Support Vector Machine (SVM) algorithms were deployed to identify genes that predict sensitivity and resistance.

Results and Conclusions: Clustering based on expression of sub-type specific genes derived from patient samples identified at least two distinct subtypes of bladder cancers in the cell lines. These subtypes co-clustered with patient samples into separate arms, validating their distinct nature. Cells in subtype 1 were more responsive to EGFR inhibition, with loss of p16 and expression of FGFR3 being associated with responsiveness and resistance. SVM analysis revealed gene sets that were strongly associated with response to each of the inhibitors that resulted in distinct separation of cells into sensitive and resistant subtypes. As would be expected, genes that were predictive of response for an EGFR inhibitor such as lapatinib were also predictive for other EGFR inhibitors such as CI1033. Interestingly, the SVM analysis identified a number of genes involved in mitochondrial NADH-ubiquinol reductase as being associated with response to the EGFR inhibitors. For two FGFR inhibitors, despite the fact that there was significant correlation between the responses in the cell lines, there was limited overlap in the genes identified by SVM. One gene that did overlap, ODZ3, has been implicated in activating MAPK signaling. These data provide early clues that suggest subtype specific response patterns in bladder cancer to targeted therapeutics, and provide information that may help drive rational combinations of drugs for future treatment of patients for precision medicine.
EXPERIENCE WITH INTRAURETHRAL COAPTITE INJECTIONS FOR URINARY INCONTINENCE
Kulwant Singh D.O., Jennifer Sung M.D., Gary E. Leach M.D.: Los Angeles, CA
(Presentation to be made by: Jennifer Sung M.D.)

Introduction and Objectives: To evaluate our results for intraurethral coaptite injections for women with stress urinary incontinence.

Methods: 36 women had intraurethral coaptite injections for the treatment of stress urinary incontinence. All of these women had 3 months or more of follow up after their last treatment. The procedure was performed transurethrally with a local anesthetic in the office. Data was collected at each follow-up visit from the patient reported subjective improvement.

Results: There were total 36 women in the study who had followup of more than or equal to 3 months after their last treatment. The average age was 73 years (range: 41-90 years). The average follow-up length from last treatment was 25 months (range: 3 months – 87 months). Mean first valsalva leak point pressure prior to injection was 44 cm H2O (range 5-107 cm H2O). Mean number of treatments was 2 (range: 1-7 treatments). Average interval between each treatment was 9 months (range 1-60 months). At the time of last follow up, 10 (28%) women reported having a 100% improvement of their stress incontinence symptoms, 11 (31%) women reported being 50-90% better, and 15 (42%) women reported being <50% improved. We analyzed women with overactive bladder, urethral hypermobility, abdominal leak point pressure <60, and midurethral sling prior to the coaptite injection (see table below). There was no correlation between any analyzed parameter and outcome after coaptite injection. Five patients (9%) experienced urinary retention after the injection, requiring temporary catheterization for less than 1 week.

Conclusions: Intraurethral coaptite injection is a safe and effective procedure in the office setting. There was no statistically significant impact on outcome for those patients who had mid urethral sling, overactive bladder, ALPP < 60, or urethral hypermobility prior to the coaptite injection.

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Source of Funding: None
URGE URINARY INCONTINENCE IN THE SETTING OF NEWLY IMPLANTED ARTIFICIAL URETHRAL SPHINCTERS
Patrik Luzny, M.D., Ryan F. Coates, M.D., Jeremy B. Myers, M.D. FACS, William O. Brant, M.D. FACS FECSM: Salt Lake City, UT (Presentation to be made by Dr. Luzny)

**Purpose:** Stress urinary incontinence (SUI) represents a significant problem in up to 10% of patients with history of radical prostatectomy and up to 3% of patients following a transurethral resection of prostate (TURP). Artificial urethral sphincter (AUS) is the gold standard for treatment of moderate to severe male SUI due to intrinsic sphincter deficiency (ISD) following prostate surgery. However, there is only very limited amount of data on urge urinary incontinence (UUI) after an AUS placement.

**Methods:** We have identified 104 patients who underwent an AUS implantation at a single site by a single surgeon between 2010 and 2013. The Michigan Incontinence Symptom Index (M-ISI) questionnaire administered in the clinic was used to evaluate patients' symptoms. Only patients with at least one pre-operative and post-operative evaluation were included in the study. The pre- and post-operative UUI and SUI sub scores (0-12) were then compared. Postoperative UUI scores ≥9 were considered clinically significant.

**Results:** Due to a change in our electronic medical record system, only 25 patients were found to have the required records to be included in the study. The mean patient age was 70.6 (range 61-83) years. The etiology of urinary incontinence was radical prostatectomy in 22 (88%) and transurethral resection of prostate in 3 (12%) patients. Eleven (44%) patients had a history of previous radiation for prostate cancer. Eighteen (72%) patients underwent a virgin AUS placement, 7 (28%) underwent a replacement of an existing device. The mean pre-operative SUI and UUI sub scores were 10.12 (SD = 2.42) and 9.48 (SD = 3.78), respectively. Post-operatively, the mean SUI and UUI sub scores were 4.72 (SD = 2.73) and 5.24 (SD = 3.31). Nineteen (76%) patients had a pre-operative UUI sub score ≥ 9 compared to 5 (20%) patients post-operatively. Of these 5 patients, 1 had an increase in UUI score, 1 had no change, and 3 had a small improvement ≤ 2 points. Four of the 5 had previous radiation for prostate cancer.

**Conclusions:** The M-ISI is not a reliable tool for detection of UUI in patients suffering from severe SUI prior to AUS implantation. Successful placement of AUS can unmask significant UUI. Patients suffering from continuous urinary incontinence after placement of AUS should be screened for UUI, especially those with history of prostate radiation.

**Source of Funding:** None
**Objectives:** Urinary incontinence (UI) can adversely impact quality of life especially in patients with neurologic disease or injury, who may already have restricted routines. Current data is limited on the quality of life (QoL) in the subset of patients affected with UI who also have underlying neurologic conditions therefore a systematic review of the contemporary literature was conducted.

**Methods:** In accordance with the PRISMA statement, a systematic review was conducted in PubMed/Medline databases and Cochrane Library database for English language publications between 1/1/2000 and 1/1/2014. These databases were queried using the keyword string of (“urinary incontinence” [MeSH] AND (“quality of life” [MeSH] OR “patient reported outcomes”) AND (“Multiple Sclerosis”[Mesh] OR ”Spinal Cord Injuries”[Mesh] OR ”Parkinson Disease”[Mesh] OR ”Stroke”[Mesh] OR ”Spinal Dysraphism”[Mesh])). Articles were first screened based on their abstract and select full-text articles were then reviewed for eligibility. Articles with no QoL measures assessing impact of UI were excluded. Studies were evaluated based upon population, design, baseline characteristics, QoL measurement tools, urinary specific QoL, interventions, major results/conclusions, and study limitations. Risk of bias was assessed regarding randomization, incomplete outcome data, selective outcome reporting, and other biases.

**Results:** Of the 60 abstracts screened, 26 full text studies were assessed and subsequently 3 studies were excluded (no QoL measurements for UI). We included 23 studies including a total of 2633 patients with mean age of 46.3 yrs. Nine (39%) studies explored the impact of UI on QoL and 14 (61%) studies explored the effect of an intervention. The most commonly utilized validated QoL measurement tools were The Medical Outcomes Study SF-36/SF-12, Qualiveen, Incontinence Quality of Life questionnaire (I-QoL), King’s Health questionnaire, and the Incontinence Impact Questionnaire 7 (IIQ-7). The Qualiveen questionnaire was the only urinary specific QoL tool identified for patients with underlying neurologic conditions. Patients with an underlying neurologic condition with dependent or caregiver assisted bladder management had worse QoL especially in areas of physical function, emotional and mental health, and social relationships, when compared to patients with normal bladder function. The use of pelvic floor therapy, biofeedback, and sacral neuromodulation was found to improve QoL outcomes vs. baseline. Seven studies including 3 RCT have demonstrated improved QoL after 200 U or 300 U OnabotulinumtoxinA detrusor injections. Reconstructive surgery for continent catheterizable channels did not show significant improvement in QoL measures in a single study included in this review.

**Discussion:** Despite our heterogeneous population and the variety of QoL measurement tools, current evidence suggests patients with underlying neurologic conditions and associated UI have poor QoL, which may be improved with certain bladder management methods. Validated questionnaires presenting patient reported outcomes and specific impact of bladder dysfunction on QoL in patients with neurologic conditions are needed in order to assess differing treatment strategies and impact on QoL.

**Source of Funding:** This project was supported in part by a generous reconstructive urology educational grant from American Medical Systems, Inc., Minnetonka, MN.
FEASIBILITY AND SAFETY OF ARTIFICIAL URINARY SPHINCTER IMPLANTATION AFTER ROBOTIC-ASSISTED RADICAL PROSTATECTOMY
Patrick Ramos, M.D., Eric Tygenhof, M.D., Mukul Patil, M.D., Stuart Boyd, M.D.: Los Angeles, CA
(Presentation to be made by Dr. Ramos)

Introduction and Objective: Stress urinary incontinence (SUI) after radical prostatectomy is a well-documented complication with no pharmaceutical treatments. To our knowledge there are no studies examining the feasibility and safety of artificial urinary sphincter (AUS) implantation in men after robotic-assisted laparoscopic radical prostatectomy (RALP).

Method: Our series from 2009 through 2012 includes 14 men who suffered from stress urinary incontinence after undergoing RALP. We retrospectively reviewed the charts of all men who have undergone AUS placement after RALP with focus on perioperative outcomes.

Results: The patients had a mean age of 66.6 (range 52-75) and a median American Society of Anesthesiologists score of 2 (range 2-3). Patients with persistent/bothersome SUI sought surgical correction at a mean of 20.1 months after RALP (range 4-43). Stability of carcinoma was confirmed prior to proceeding with AUS placement. All of the men had the AUS cuff placed at the bulbar urethra, while the AUS reservoir was implanted into the retroperitoneum due to the changes in the retropubic anatomy following RALP. Three of the men had a history of adjuvant pelvic radiation as well. None of the men had intraoperative complications. After mean follow-up of 7.3 months (range 0-36) no post-operative complications were identified. Two of the men required surgical revision (one for mechanical failure of the reservoir at 4 months and another for cuff downsizing at 10 months). Three men had additional procedures at the time of AUS: two had a bladder neck incision for stricture along with a UroLume placement in one. The third man had an inflatable penile prosthesis implantation concomitantly. All men with documented follow-up all had a functioning sphincter with a satisfactory continence.

Conclusions: This early case series demonstrates the feasibility and safety of AUS implantation after RALP. AUS should be considered a mainstay in the treatment of post-RALP SUI as it provides an opportunity for improved quality of life after prostatectomy.
Purpose: Urodynamic testing is an invasive procedure that can be associated with physical discomfort and emotional distress. Studies that have looked at patient perceptions of this testing in the past have focused mainly on women. The purpose of this study was to determine predictors of physical and emotional distress associated with urodynamic testing in all patients, including men and women both with and without neurologic conditions.

Materials and Methods: This is an anonymous questionnaire-based study completed by patients immediately after undergoing fluoroscopic urodynamic testing. Participants were asked questions pertaining to their perceptions of physical and emotional distress related to the study, their urologic and general health history, and demographics. Logistic regression was performed to determine predictors of physical and emotional distress.

Results: A total of 314 patients completed the questionnaire. Half of the respondents (50.7%) felt that the exam was neither physically nor emotionally distressing, 29.0% felt that physical distress was the worst part of the test, 12.4% felt that emotional distress was the worst part of the test, and 7.9% felt that the physical and emotional components of the test were equally bad. The most commonly reported part of the test associated with physical discomfort was placement of the urethral catheter in 42.9% of the subjects, while the most commonly reported part of the test associated with emotional discomfort was no emotional discomfort (49.0%) followed by anxiety (27.7%). Not having a neurologic problem (OR 0.23; 0.121, 0.167), placement of a rectal catheter (OR 2.975; 1.171, 7.559), and younger age (OR 1.709; 1.181, 2.469) were all significant predictors of physical discomfort. There were no significant predictors of emotional discomfort based on our model. Of interest, gender, self-rated health status, race, having had a prior cystoscopy, and the clinical reason for the study did not serve as independent predictors of either physical or emotional discomfort.

Conclusions: Urodynamic studies were very well tolerated regardless of gender. Participants with neurologic conditions were less likely to experience physical discomfort associated with the study compared to subjects without neurologic conditions. The most commonly reported part of the study with regards to physical discomfort was the placement of the urethral catheter, while the most commonly reported part of the study with regards to emotional discomfort was anxiety. These findings are useful in counseling patients as to what to expect when having urodynamic procedures.
Purpose: Predictors of success of stage I sacral neuromodulation (SNM) for patients with refractory, idiopathic overactive bladder (OAB) are lacking. We previously showed that if detrusor overactivity (DO) was present, a lower volume at DO predicted SNM failure. However, a large proportion of women presenting with OAB do not demonstrate detrusor overactivity on urodynamics (UDS), suggesting a sensory etiology. We sought to determine whether sensory UDS parameters predicted success of stage I interstim in women with OAB without DO.

Methods: We reviewed all stage I interstim procedures with preoperative UDS for idiopathic OAB without DO from 2000 to 2013. By convention, success was defined as >50% subjective improvement in incontinence episodes and/or pad use during the trial period. We compared stage I successes and failures in terms of demographic and clinical characteristics, as well as UDS sensory parameters including first sensation of filling (FSF), capacity, and first sensation ratio (ratio of FSF to capacity) to determine if we could find any predictors of stage I success.

Results: Of 51 total patients identified who underwent stage I SNM with no evidence of DO on preoperative UDS, 38 were successful (75%). Age, parity, diabetes, body mass index, smoking status, and postmenopausal state were not significantly different between successes and failures. Mean FSF was slightly lower for failures (77 mL) versus successes (88 mL), but this was not significant. The average maximum capacity was also similar at 351 mL for successes versus 364 mL in failures. Mean first sensation ratio was also not significantly different (0.23 for successes versus 0.21 for failures).

Conclusions: UDS remain an important part of the diagnostic evaluation of the patient with refractory OAB. However, in our series of patients with idiopathic OAB without DO, UDS sensory parameters were not predictive of stage I SNM success.
NATIONAL PRACTICE PATTERNS IN INFECTION PROPHYLAXIS FOR INTERSTIM: A SURVEY OF HIGH-VOLUME PROVIDERS
Eugene W. Lee, M.D., Alvaro Lucioni, M.D., Una J. Lee, M.D., Kathleen C. Kobashi, M.D.: Seattle, WA
(Presentation to be made by Dr. E. Lee)

Introduction: Sacral neuromodulation using the Interstim device is a safe and effective treatment for urgency, frequency, urgency incontinence, non-obstructive urinary retention, and fecal incontinence. However, there is no standard recommendation regarding infection prophylaxis. Therefore, we surveyed the infection prophylaxis patterns of high-volume Interstim providers in order to describe current practice patterns in peri-operative infection prophylaxis.

Methods: A web-based survey was sent to 35 high-volume providers identified by Medtronic, including urologists, gynecologists, and colorectal surgeons.

Results: Our response rate was 89% (31/35). Most providers were urologists (51%) followed by gynecologists (39%) and colorectal surgeons (10%). The majority (74%) have performed more than 200 procedures and 22% have done more than 500. The length of the testing period is generally 1-2 weeks. Only 13% of the providers surveyed routinely screen for MRSA. All providers administer pre-operative antibiotics (most commonly cefazolin or vancomycin) and 81% administer post-operative antibiotics (most commonly cephalexin and TMP-SMX), with the majority prescribing 5-7 days. Six providers (19%) do not prescribe any post-operative antibiotics. In addition, 71% of respondents employ adjunctive measures, with intra-operative wound irrigation and/or pre-operative chlorhexidine shower being frequently used. After both stage 1 and 2, 19% of providers prohibit showering for >3 days post-operatively, while 61% permit showers after 1-2 days and 19% advocate no bathing restrictions at all.

Conclusions: We present the infection prevention practices of high-volume Interstim implanters in the US. Further study is warranted to guide evidence-based practice in infection prophylaxis for Interstim.
THE VAGINAL WALL SLING: OUTCOMES FROM A PILOT STUDY
Michelle Lightfoot, MD, Sean Munroe, BS*, Muhamnad Alsyouf, MD*, Kristene Myklak, MD, Andrea Staack, MD, PhD: Loma Linda, CA
(Presentation to be made by Dr Myklak)

Introduction and Objectives: Alternatives to synthetic mesh slings for patients who are not good candidates or want to avoid sling material are needed. We aim to evaluate urinary symptoms and patient satisfaction in patients who received an autologous suburethral sling using vaginal wall tissue for the treatment of SUI.

Materials and Methods: Patients who underwent vaginal wall sling placement by a single surgeon between May 2011 and June 2013 were reviewed retrospectively. Patient characteristics, voiding symptoms, and surgical outcomes were obtained from the medical records. A telephone survey was also performed to assess patients’ current voiding symptoms postoperatively. Postoperative satisfaction was measured with a Likert scale (1=very dissatisfied, 5=very satisfied). Mann-Whitney U test and Fisher’s Exact test were used for statistical analysis, with significance at p<0.05.

Results: Pubovaginal sling surgery was performed in 105 patients during the time period studied. Of these, 25 (24%) underwent vaginal wall sling placement. Mean patient age was 62.8 years (range 29-86). Patients had a history of 1-8 vaginal deliveries (mean 3.4), and 15 patients (60%) had previous surgery for SUI or POP. Ten patients had synthetic mesh placed with prior surgeries, and five were unsure if mesh was placed. All patients concurrently underwent either cystocele repair (n=24) or sacrospinous ligament suspension (n=1) along with vaginal wall sling. Mean sling length was 8.5cm (range 5.5-11cm). Postoperatively, 3 patients experienced temporary urinary retention. Self-reported pad usage was 2.0/day (range 0-3.5) preoperatively and 0.4/day (range 0-3) in the early postoperative period (mean of 34 days postoperatively), which presented a statistically significant decrease (p=0.004). Sixteen of the 25 patients (64%) agreed to participate in a phone survey at a mean of 383 days postoperatively (range 40-657 days), where eleven patients (68%) reported zero pad usage, while three (19%) used 1-2 pads/day and two (13%) used more than 2 pads/day. Patients rated their satisfaction from surgery as 3.5 on a 1-5 Likert scale (1=very dissatisfied, 5=very satisfied). Patients with zero pad usage were significantly more satisfied than those who continued to require pads (4.2 versus 2.0, p=0.019).

Conclusion: Over two thirds of patients who received a vaginal wall sling experienced complete resolution of SUI in this pilot study and an additional 13% reported improvement in pad usage postoperatively. Vaginal wall sling may be an alternative for patients with a cystocele and mild incontinence who wish to avoid vaginal surgery using synthetic mesh; however, larger studies are needed.

Funding: There was no external funding source for this research.
PROLAPSE REPAIR WITH NON-FROZEN CADAVERIC FASCIA LATA: LONG-TERM RESULTS
Jennifer Sung M.D., Kulwant Singh D.O., Sharron L. Mee M.D., Gary E. Leach M.D.: Los Angeles, CA
(Presentation to be made by Jennifer Sung M.D.)

**Introduction:** With the increasing concerns regarding mesh complications, there has been renewed interest in pelvic organ prolapse repairs without mesh. Since 2000 we have performed the cadaveric fascia cystocele repair with sling procedure (CaPS) utilizing a solvent dehydrated non-frozen cadaveric fascia lata (Suspend / Tutoplast Fascia Lata from Coloplast). Our objective is to present the long-term outcomes for the cystocele repair portion of the CaPS procedure.

**Materials and Methods:** By June 2014, 624 patients had undergone a CaPS cystocele repair procedure. An ongoing review of these patients was performed to measure prolapse recurrence, sexual function, and patient satisfaction with a questionnaire and exams. Failure was defined as recurrence of cystocele grade 2 or higher using the Baden-Walker system. 514 out of 624 (82%) patients have follow-up available via questionnaire. The average follow-up period with a questionnaire was 55 months (Range: 4 – 173 months, median 42 months). 193 (37%) patients have at least five-years of follow-up with questionnaires. 509 out of 621 (82%) patients have 3 months or more of follow-up available with exams. Average follow up period with exams was 39 months (Range 3 – 188 months, median 25 months). 119 (23%) of patients have at least 5 years of follow up with exam.

**Results:**

**Prolapse:** Average patient age at the time of surgery was 65 years (Range: 30 – 99 years). Prolapse failure occurred in 105 / 509 (20%) patients at an average of 34 months (range 3 - 128 months). 39 / 509 (7.6%) patients had cystocele recurrence. 60 / 509 (12%) patients had vault prolapse. 6 / 509 (1%) patients had uterine prolapse. 63 / 105 (60%) patients chose not to have intervention. Abdominal sacrocolpopexy was done for 22 patients, transvaginal fascia repair was done for 18 patients, and transvaginal mesh repair was done for 12 patients.

**Sexual Function:** Of the 88 / 514 (17%) women who were sexually active, 25 / 88 (28%) reported discomfort with intercourse.

**Patient Satisfaction:** At the time of each patient’s last questionnaire, 422/514 (82%) patients would recommend the surgery and 422/514 (82%) patients would repeat the surgery. 311/514 (60%) patients reported 8 or greater satisfaction on a visual analogue scale of 1-10, 10 being extremely satisfied.

The complication rate was 4% (19/509) which included: 1 small bowel injury during suprapubic tube placement that required bowel resection, 1 infected hematoma under the vaginal wall that required debridement, mesh erosion occurred in 2 patients, 1 ureteral obstruction that required stent placement, 10 patients required reoperation to remove vaginal granulation tissue, 1 patient required prolene stitch removal from vagina due to difficulty with intercourse, 3 patients had wound separation that healed spontaneously with estrace cream.

**Conclusion:** With a maximum follow-up of more than 13 years and an average follow-up of 39 months, patients undergoing the CaPS procedure have excellent and durable results. 80% of patients had no significant prolapse recurrence. There was high patient satisfaction and low morbidity.

**Source of Funding:** Coloplast
PATIENT-TAILORED MESH GRAFT FOR ANTERIOR COMPARTMENT REPAIR USING VERTESSA LITE MESH: JUST ENOUGH BUT NOT TOO MUCH
Matthew E. Karlovsky, M.D.: Phoenix, AZ
(Presentation to be made by Dr. Karlovsky)

Purpose: Pelvic Organ Prolapse affects women as they age. The desire to address symptomatic anterior prolapse with transvaginal mesh kits to bolster the repair, though more anatomically successful than native tissue repair, had its usage decelerated due to the FDA Bulletin of 2011 and complications of mesh that may involve large mesh loads and injury due to kit trocar usage. Small, tailored made mesh grafts that are intra-operatively sized to the patient’s anterior compartment after colporraphy may offer the benefit of mesh reinforcement while minimizing mesh load and avoiding trocar passage. I investigated the short term success rate, extrusion rate, and graft size required in a consecutive series of patients electing mesh repair for their symptomatic cystocele with “patient-tailored” mesh grafts.

Materials & Methods: Sixteen consecutive patients with symptomatic cystocele underwent reconstruction with patient tailored graft from Vertessa Lite mesh (Caldera Medical Inc., Agoura Hills, CA) sized to the anterior compartment after midline plication. Mean preoperative statistics include age, BMI, Baden-Walker cystocele grade, POPQ stage, mean graft size (Length cm x Width cm), and number of cases involving transvaginal hysterectomy or slings were recorded. Vertessa Lite mesh consists of a blue colored, light weight (23.8 gm/m²) polypropylene type 1 mesh that is 0.275 mm thick, and appears to have a “square type” weave whose pore size is 1300 μm, with an interstitial pore size 170 μm. The post-plication anterior compartment length and width were measured with an intraoperative ruler and the graft was then cut from a 10 cm x 20 cm pre-packaged Vertessa Lite mesh. Its four points when then sutured to the pelvic side wall fascia, and the proximal vaginal apex and distal bladder fascia. Mean and median post-operative follow up, post-operative BW stage and POPQ stage were recorded, as well as incidence of extrusion and dyspareunia.

Results: Mean age and BMI were 65.3 and 30.66. Mean pre-operative Baden Walker grade and POPQ stage were 3.1 and 2.7. Mean graft size was 3.4 cm length x 5.3 cm width. There were 5 simultaneous transvaginal hysterectomies, and 10 concomitant midurethral mesh slings. Follow up range was 1.5 months to 9 months. Mean and median follow up were 4.6 months and 4 months. Mean post-operative Baden Walker grade and POPQ stage were 0.2 and 0.2. There was one extrusion noted at 12 weeks of 2 mesh fibers in an area of granulation tissue that was previously treated with silver nitrate topical by the gynecologist at 6 weeks post operatively. The mesh fibers were excised in the office. No other extrusions were noted. Phone call follow-up of the 8 sexually active patients revealed 5 to be sexually active and 4 to have no dyspareunia. The one patient who had dyspareunia was not the one with the extrusion.

Conclusions: “Patient-tailored” mesh grafts for anterior compartment repair are feasible, and can achieve a desired compromise between use of mesh and reduced mesh implant load. In short term follow up, there was excellent post-operative anterior support, with 1 minor extrusion which may have been caused by silver nitrate topical. Of those patients who were sexually active, one reported dyspareunia. In the age of concern over transvaginal mesh kits with large mesh implant loads and potential FDA device reclassification, tailor made small mesh grafts may become a popular option. Further follow up is warranted to validate long term success rates and potential long term extrusion rates.

Source of Funding: None
PELVIC MESH AND MALPRACTICE: CURRENT AND FUTURE CONCERNS
Matthew E. Karlovsky, M.D.: Phoenix, AZ

The recent FDA proposal of May 1, 2014 to reclassify surgical mesh for transvaginal pelvic organ prolapse repair from a class II to class III device and urogynecological surgical instrumentation from a class I to class II device continues to highlight the importance of potential medico-legal risk implications when using these products. Avoiding litigation and taking care of patients are at the forefront of all surgeons’ daily thoughts and actions. Every surgery can involve potentially unforeseen risks despite skillful execution of treatment, while “standard of care” is not equivalent to perfection in practice or a guarantee of recovery. However, surgeries that involve transvaginal mesh with FDA bulletins, and clinical practice guidelines offer a number of pitfalls that urologists must bear in mind during surgical planning, the informed consent process, and management of expectations and complications.

Statements by AUA, AUGS and SUFU all support judicious use of mesh on a case by case basis. Mesh does increase anatomic success in the anterior compartment and can be considered first line for recurrent prolapse. Physician discretion and patient characteristics must play a role in deciding where mesh may be most appropriate. Questions arise: Should mesh be favored for those presenting at younger ages as their connective tissue is demonstrably weaker, or should it be avoided if they are more sexually active? Should mesh be favored in those with chronic constipation or cough who may be a higher risk of failure? Should mesh be favored in the elderly to mitigate risk of failure and potential repeat anesthesia, and/or if no longer sexually active? The potential level of forethought may seem beyond what would be desirable for the reasonable urologist.

A brief legal primer follows: the classic definition of malpractice Negligence involves four tests that must be met for a successful claim: 1. Duty, 2. Breach of Duty, often interpreted as “Standard of Care”, 3. Damages or Harm sustained, 4. Causation-Damages as a direct result of Harm sustained. Breach of Duty constitutes three areas: 1. Lack of Informed Consent of either: a. risks and alternatives (to mesh), b. option to change one’s mind once risks are known, 2. Unnecessary surgery (mesh), 3. Inadequate technique. In addition, lack of documentation of the informed consent process conversation, not just a consent form, is often overlooked due to busy office schedules and high patient loads but constitutes a common weakness that can be exploited by plaintiff counsel.
Purpose: Complications from synthetic mesh used for urinary incontinence (SUI) and pelvic organ prolapse (POP) have gained increasing exposure in the literature. Mesh removal of any kind is a complex, challenging procedure, and the surgical approach depends on the type of procedure performed, as well as surgeon preference. Most of the mesh used for SUI and POP can be removed trans-vaginally, but some, particularly those placed for abdominal sacrocolpopexy (ASC), have been removed by the trans-abdominal approach. ASC is considered the “gold standard” treatment for apical vaginal prolapse, and it can be performed via an open, laparoscopic or robotic technique. Literature regarding laparoscopic and robotic-assisted ASC outcomes reports both subjective and objective improvements are more than 80% (2-4). However, ASC may result in significant complications, necessitating removal. We present our case series in the removal of ASC mesh from the transvaginal approach.

Materials and Methods: Patient medical records were reviewed after IRB approval was obtained at our institution. Between December 2013 and May 2014, ninety-five cases of mesh removal from SUI and POP procedures were removed at our institution. Five of them involved mesh-augmented sacrocolpopexies, of which three were removed transvaginally. Surgical outcomes were collected and analyzed.

Results: In our case series, three patients underwent complete removal of sacrocolpopexy mesh trans-vaginally with and without endoscopic assistance, thereby avoiding abdominal exploration. Preoperatively, the patients were counseled that both trans-vaginal and trans-abdominal approaches might be necessary to completely remove any residual mesh. The transvaginal approach was initially employed due to prior evidence of mesh extrusion or exposure. Once the SCP mesh was identified transvaginally, we dissected it free and followed its path apically. Pediatric laparotomy pads and retractors were used for identification and prevention of injury to the surrounding organs. The ASC mesh was seen to insert onto the sacral promontory. In two of the three cases, a rigid cystoscope with the 30-degree lens was used to identify the point of mesh attachment at this point. Under cystoscopic guidance, we then transected the mesh using Jorgenson scissors. Once the entire mesh was removed, a modified sacrospinous ligament suspension was performed to fix the apical prolapse. Other compartments were repaired as needed without the use of mesh. The estimated blood loss was 100-500 ml. No intraoperative or perioperative complications were observed. The patients were discharged from the hospital with urethral catheters 24-48 hours later. On their initial follow-up visit, all patients reported significant improvement in their original symptoms.

Conclusions: To avoid the morbidity associated with abdominal exploration, transvaginal removal of ASC mesh can be safely performed with effective surgical outcomes. Endoscopic assistance using a cystoscope lens may be needed to remove the mesh from the sacral promontory and avoid unnecessary complications.

Source of Funding: None
EXTRAVASATION ON POSTOPERATIVE RETROGRADE URETHROGRAM STRONGLY PREDICTS STRICTURE RECURRENCE AFTER URETHROPLASTY
Eric S Wisenbaugh, M.D., Christopher J Martin, M.D., Logan T Wineland, M.D., Christopher E Wolter, M.D.: Phoenix, AZ
(Presentation to be made by Dr. Wisenbaugh)

Purpose: Multiple preoperative variables have previously been identified as risk factors for stricture recurrence after an urethroplasty; however, contrast extravasation on postoperative retrograde urethrogram (RUG) has never been exclusively evaluated as a potential risk factor for recurrence. We investigate the association of contrast extravasation on postoperative RUG with stricture recurrence.

Materials and Methods: An IRB-approved database was generated for every urethroplasty performed at our institution between 1999 and 2013. Inclusion criteria included any patient with an urethroplasty for a stricture anywhere along the urethra who had a RUG performed postoperatively and was followed for at least 3 months. Success was defined by the absence of any subsequent stricture-related procedure. We evaluated the association between contrast extravasation and success in both univariate and multivariate models.

Results: Ninety one patients met inclusion criteria with a median follow-up of 14 months. Twenty five patients had extravasation noted on postoperative RUG and of these, 76% required a subsequent procedure compared to only 27% of the 66 patients who did not have any extravasation (Relative Risk of 2.8, p<0.0001). A multivariate model was generated which included type of repair (ex: primary anastomosis, buccal or skin graft, island flap, staged or combined), location of stricture, length of stricture and previous urethrotomies or dilations, of which contrast extravasation was the most significant predictor of failure (p=0.0013).

Conclusions: Contrast extravasation on postoperative RUG strongly predicts the need for a subsequent stricture-related procedure after formal urethroplasty. These patients may warrant closer follow-up after catheter removal.
RISK OF ERECTILE AND EJACULATORY DYSFUNCTION AFTER BULBAR URETHROPLASTY: ANALYSIS OF A MULTICENTER COHORT

Liam C. Macleod, MD MPH*, Jeremy B. Myers, MD, Christopher D. McClung, MD*, Bradley A. Erickson, MD*, Sean P. Elliot, MD MS*, Bryan B. Voelzke, MD MS: Seattle, WA (Presentation to be made by Dr. Macleod)

Purpose: Open urethroplasty is the most durable option to manage urethral strictures. Transection of the corpus spongiosum and peri-prostatic dissection have been theorized to increase the risk of postoperative erectile dysfunction and ejaculatory dysfunction. We hypothesized that de novo dysfunction may be more likely in men undergoing reconstruction within the proximal bulbar urethra due to greater proximity to the dorsal penile nerves. In order to test this hypothesis we compared pre- and post-operative patient-centered outcomes data following bulbar urethroplasty in a multi-center surgical cohort.

Materials and Methods: After obtaining IRB approval, participants were selected from the TURNs (Trauma and Reconstructive Network of Surgeons) database. This is a prospectively maintained, longitudinal database that includes pre- and post-operative data from reconstructive urologic surgeons across eight academic centers. Data from five surgeons was available. Men were eligible to participate if they underwent bulbar urethroplasty for a stricture of any etiology between May 1, 2012 and December 31, 2013. Additional inclusion criteria were completion of the brief Sexual Health Inventory for Men (SHIM), which measures erectile function, and the Male Sexual Health Questionnaire (MSHQ), which measures ejaculatory function. Patients were excluded if the post-operative questionnaire was completed ≤ 60 days after bulbar urethroplasty. Paired t-tests comparing pre- and post-operative SHIM and MSHQ scores for each patient were analyzed in a stratified manner, by type of urethroplasty (anastomotic, buccal mucosal graft [BMG] with roof/floor strip anastomosis, or dorsal or ventral BMG onlay) and, in a separate analysis, by location within the bulbar urethra (proximal, mid, distal). All statistical tests were two-sided, and all analyses were performed in STATA 12 (College Station, TX).

Results: 153 men were considered for analysis. Eighty-eight men were excluded for missing pre- and/or post-operative SHIM/MSHQ scores or for having too short an interval for the post-operative questionnaire. This left 65 men in the final analysis. Mean age of the eligible cohort was 44.8 (range 16-82). The etiology of strictures included idiopathic (23), trauma (19), iatrogenic (15), radiation (4), lichen sclerosis (2), infection (2), and failed hypospadias (1). Preoperative SHIM/MSHQ scores were completed on average 42 days before surgery (range 1-60). Post-operative SHIM/MSHQ scores were completed on average 155 days after urethroplasty (range 78-502).

Numbers of strictures located in the distal, mid, and proximal bulbar urethra was 13, 29, and 23, respectively. There were 45 anastomotic repairs, 11 BMG with roof/floor strip anastomoses, and 9 BMG dorsal or ventral onlay repairs. Stratification by bulbar urethroplasty type and bulbar location revealed no statistical difference between pre- and post-operative erectile function, as measured by the SHIM score. Stratified analysis of ejaculation, as measured by the MSHQ score, revealed that anastomotic urethroplasty was associated with worsened ejaculation following surgery (pre: 14.6 and post: 11.8; p<0.007); however, no significant difference was noted in the other two types of bulbar urethroplasty repairs. Similarly, distal repairs/proximal repairs were not associated with significant change in MSHQ score, but mid-bulbar repairs were associated with decreased ejaculatory function (pre: 17.5 and post:s 13.1, p<0.001).

Conclusions: Initial analysis of our study hypothesis did not reveal bulbar location of urethroplasty to impact erectile function. Post-operative ejaculation does appear to be negatively impacted following anastomotic urethroplasty; however, repeated analysis using larger numbers of patients will be necessary to validate these findings.

Source of Funding: University of Washington KL2 Career Development Award and Joe W. & Dorothy Dorsett Brown Foundation
TROCHAR CYSTOTOMY FOR CONTINENCE BY SELDINGER TECHNIQUE: A BOON FOR AFFORDABLE CARE ORGANIZATIONS, ACOS, IN CHRONIC DISEASE
Anthony H. Horan, MD: Delano, CA

Introduction: In the male the penis will wear out when chronically constricted with a condom catheter and or the urethra will be injured by a Foley balloon pulled too low in the insensate male; in the female a urethral catheter will slowly enlarge the urethra until there is hole at the bottom of the bladder that is never continent. For the past 7 years the speaker has been replacing urethral catheters with suprapubic catheters placed via the Seldinger technique in a population of the unconscious, cord injured, spina bifida, atonic bladder, or stress incontinence patients. It seems that there are fewer calls from the Skilled Nursing Facility and Emergency Room in urethral injury or chronic incontinence.

Materials and Methods: 60 patients have been operated. The bladder is entered just as the kidney is entered first with a microstix and then with the standard percutaneous nephrostomy set. Dilatation is carried up to #26 French with frequent checks with the cystoscope for correct depth. Then the #24 French dilator is use to insert blue working sheath. The cystoscope is use to be sure the working sheath is in the bladder. Then a #18 French all silicone Foley (Coude tip) with a 5 cc balloon is inflated in the bladder and pulled up to the dome. It is then secured for two weeks with two 2-0 Nylon retention sutures on either side. In the case of morbid obesity this can be taxing. Because the suprapubic wound leaks very briefly Seldinger technique represents a huge advance over the old open incisional technique.

Results: All 60 cystotomy tubes have remained in place. There have been fewer consults for work up of hematuria and fever following catheter injury. The savings in linen on the female side are presumed to be large but hard to quantitate.

Conclusion: Suprapubic cystotomy is underutilized in the chronic disease setting. The Seldinger Technique makes it a more acceptable change in routine for family used to monotonous care because there is little post-op’ leakage. Affordable care organisations (ACOS) should take note of the large savings in the cost of care possible.
MOST MEN WITH URETHRAL STRICTURES ARE TREATED ENDOSCOPICALLY WITHOUT PRIOR URETHRAL IMAGING AND WITHOUT BEING OFFERED THE OPTION OF URETHROPLASTY
Rachel Quinn, M.D. and Joel Gelman, M.D., Orange, CA
(Presentation to be made by Dr. Quinn)

Objectives: Our objective was to assess patients who presented with a diagnosis of recurrent urethral stricture disease to determine what diagnostic studies were performed prior to intervention, and what treatment options were then offered.

Methods: With IRB approval, data was prospectively collected from 100 patients (age 18-80) with recurrent anterior urethral strictures seen at our institution between April, 2011 and January, 2014. We reviewed 111 records to identify 100 patients for this study as only 11/109 patients presented without having prior treatment. Patients were encouraged to bring prior medical records to their initial appointments. At the time of consultation, each patient was specifically asked if imaging such as a retrograde urethrogram was performed prior to treatment. In addition, patients were then asked what treatment options were discussed and offered.

Results: The vast majority of our patients (88%) were treated with dilation or a direct vision internal urethrotomy (DVIU) based on the diagnosis of a stricture on cystoscopy without prior imaging to determine the length of the stricture. Moreover, 77% of these men underwent repeated endoscopic treatments without imaging. When asked if open urethroplasty was offered as a treatment option, 96% indicated that it was not mentioned as an option prior to initial treatment, and of those that underwent multiple endoscopic treatments, the majority stated that open urethroplasty was not offered after there was a recurrence following endoscopic treatment.

Conclusions: Although Urology text books and current literature suggests that imaging should be performed prior to treatment, open urethroplasty may be the best option especially after a failed dilation or DVIU, and a discussion of all reasonable options is a part of informed consent, most men with anterior urethral strictures are managed endoscopically after a diagnosis made by cystoscopy without being offered the option of urethroplasty.
ISOLATED BULBAR URETHRAL STRICTURES IN PATIENTS PRESENTING WITH FAILED OR PREVIOUS HYPOSPADIAS REPAIR

Vera Trofimenko, M.D., M.A.S., Darshan P. Patel, B.S., Sean P. Elliott, M.D., M.S., Bryan B. Voelzke, M.D., M.S., Bradley A. Erickson, M.D., M.S., Nejd F. Alsikafi, M.D., Thomas G. Smith, M.D., Christopher D. McClung, M.D., Benjamin N. Breyer, M.D., M.A.S., Alex J. Vanni, M.D., Jeremy B. Myers, M.D.: Salt Lake City, UT

(Presentation to be made by Vera Trofimenko, M.D., M.A.S.)

Purpose: Patients with a history of failed or previous hypospadias repair can present with strictures in the bulbar urethra remote from that of the primary repair. The incidence and the management of these metachronous strictures has not been well described and we sought to characterize these strictures in a multi-institutional study.

Methods: We performed a retrospective analysis of patients who underwent reconstruction of the anterior urethra between 2010-2014 at eight participating centers in the Trauma and Urologic Reconstruction Network of Surgeons (TURNS). Inclusion criteria were patients with a failed hypospadias repair, who were discovered to have an isolated bulbar urethral stricture. Patients with any other urethral strictures, including contiguous strictures, were excluded. The primary outcome was the incidence of isolated bulbar urethral strictures among patients with hypospadias who required reconstructive surgery. The secondary outcomes were the type of surgery performed, stricture length, rate of anatomic failure defined as stricture <17F on post-operative cystoscopy, and rate of clinical failure defined as requirement further surgical intervention. Simple descriptive statistical analysis was performer utilizing SPSS software.

Results: Of the 101 patients with a history of hypospadias who presented for reconstruction of the anterior urethra, 13 (12.8%) were found to have an isolated proximal, middle, or distal urethral stricture. 12 had follow up and were included for analysis. The mean age was 37.9 years (SD 15.6) and mean BMI was 29.6 (SD 6.3). The mean intraoperative length of the bulbar urethral stricture was 2.6 cm (SD 1.92). Surgery types employed were excision and primary anastamosis 6 (54%), ventral buccal graft urethroplasty 3 (27%), dorsal buccal graft urethroplasty 2 (18%), and stricturoplasty 1 (9%). The mean duration of any post-operative clinical follow up was 7.7 months (IQR: 8.7), while the mean duration of endoscopic follow up was 4.3 months (IQR: 1.73). The rate of post operative anatomic failure was 36% (4), with mean time to failure 4.2 months (IQR: 2.3). The rate of post operative clinical failure was 18% (2), with mean time to diagnosis 4.6 months, with one patient undergoing a DVIU and another a perineal urethrostomy.

Discussion: Isolated bulbar urethral strictures are a relatively common cause of reoperation in patients with history of previous hypospadias. Multiple types of urethroplasty are needed for repair of these strictures. Urologists performing urethroplasty in patients with hypospadias failure or a history of hypospadias need to be aware of the possibility of bulbar disease that may need to be addressed at the time of surgery or in a staged fashion with urethroplasty after repair of the usual distal recurrent penile stricture.

Source of Funding: This project was also supported by a generous reconstructive urology educational grant from American Medical Systems, Inc., Minnetonka, MN.
A NOVEL URETHRAL CATHETER DESIGN TO GUIDE SAFER PLACEMENT AND TO MINIMIZE RISK OF / PREVENT URETHRAL BALLOON INJURY

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San Francisco, CA
(Presentation to be made by Dr. Garcia)

Introduction and Objective: Iatrogenic urethral injury due to urethral balloon-inflation occurs regularly but with unknown incidence. Manufacturers have, to date, not incorporated any safety-oriented modifications into their catheter design. We sought to: 1) Explore the overall number of non-infectious catheter related complications in a nationally representative dataset; 2) Create novel catheter design modifications designed to guide safer catheter placement and mitigate urethral trauma caused by urethral balloon-inflation; 3). Manufacture working prototypes of our catheter; 4.) Test our catheter-prototypes on human cadavers and adult pigs.

Materials and Methods: A cross-sectional analysis of the 2006 to 2008 National Inpatient Sample was performed (a 20% stratified sampling of non-federal U.S hospitals), using ICD-9-CM diagnostic codes to identify the national annual numbers of catheter related complications in hospitalized patients. Standard (BARD™) 16-Fr. catheters were modified by thinning out a circumferential area of the balloon-port shaft, and painting this area bright-red, so that when the retention balloon is inflated within the urethra, this thinned area (“Safety Balloon”) expands, and serves to: 1. Minimize filling and pressure upon the urethra, and 2. Visually alert the operator. We measured pressure within the balloon-port during filling within the bladder and urethra using fresh human-cadavers and live-adult pigs (N=8) under anesthesia, followed by histologic analysis. We determined the lowest filling-volume necessary to activate the “safety balloon” only when the retention balloon was filled within the urethra.

Results: Over this time period, 21,566 -111,353 patients experienced a non-infectious catheter related complication. Mean patient age was 68.4 (SD=18.8); 46.2% required a procedure such as cystoscopy or suprapubic-catheter placement. Balloon-port pressure after inflation within the bladder was similar among standard catheters and our catheter prototype. Immediately upon inflation within the prostatic and bulbar urethra of both cadavers and pigs, the “safety balloon” visibly. Mean balloon-port pressure was 60% lower in our catheter prototype. Porcine model histologic analysis showed minimal to no urethral injury using our catheter as compared to a standard BARD catheter.

Conclusions: Non-infectious catheter-related complications occur regularly and are likely under-reported. The simple, intuitive, inexpensive design modifications we describe appear to reduce the damaging pressure exerted upon the urethra during urethral balloon-inflation.

Funding Source: Author Maurice Garcia supported by NIH/NICHD K08 Grant #10713482
IMPLEMENTATION OF A STANDARDIZED IMAGING ALGORITHM FOR GENITOURINARY TRAUMA MINIMIZES MISSED AND INCORRECT DIAGNOSIS OF BLADDER INJURY
Darshan P. Patel, B.S., James Morris, B.S.*, William O. Brant, M.D., James M. Hotaling, M.D., M.S., Jeremy B. Myers, M.D.: Salt Lake City, UT (Presentation to be made by Darshan Patel)

Purpose: Bladder injuries account for 10% of all genitourinary injuries sustained during trauma. A previous study from our institution has shown that compliance with recommended imaging guidelines (CT cystogram or plain cystogram with gross hematuria and/or pelvic fracture) was only 30% if excluding patients diagnosed during operative management and approximately 13% of patients had a missed or incorrectly diagnosed bladder injury. We present a retrospective cohort study at a Level I trauma center in Utah determining the effect of a standardized imaging algorithm during pelvic trauma on compliance rates with recommended guidelines and accuracy of bladder injury diagnosis.

Methods: We identified patients presenting with traumatic bladder injuries at The University of Utah Hospital, a Level I trauma center, between 01/2010-1/2014. Our primary outcomes were compliance with recommended CT cystogram or plain cystogram for patients diagnosed with bladder injury and the rates of missed or incorrect diagnoses of bladder injuries.

Results: We identified 25 patients with traumatic bladder injury presenting to our institution. Mean age was 40.8 yrs and 15 (60%) patients were males. Blunt trauma occurred in 22 (88%) cases. Mean Injury Severity Score was 33.6 (SD=15.6). The leading concomitant injuries were pelvic fractures in 24 (96%) patients, fractures of extremities in 17 (68%) patients, and rib fractures/contusion in 17 (68%) patients. Bladder injury was extraperitoneal in 16 (64%) patients, intraperitoneal in 3 (12%), and both in 6 (24%) patients. Two (8%) patients died <24 hours after presentation. Management was operative in 15 (65%) cases (43% of extraperitoneal injuries, 100% of intraperitoneal injuries, and 100% of extraperitoneal and Intraperitoneal injuries). Compliance with recommended imaging was 96% in the 24 cases where cystogram would be indicated using our algorithm. In the single case that did not receive an initial cystogram, CT abdomen/pelvis suggested both extraperitoneal and intraperitoneal bladder injuries and the patient was taken for operative exploration rather than further radiologic investigaton due to the severity of his overall injuries. Initial plain cystogram or CT cystogram diagnosed 96% of all bladder injuries, except a single missed diagnosis of intraperitoneal injury by CT cystogram, later discovered during an orthopedic procedure less than 24 hrs of presentation. Diagnosis was not delayed in any case beyond 24 hours.

Discussion: Established management protocols reduce time to critical interventions and minimize the likelihood of missed injuries in trauma care. Our results suggest that a standardized imaging algorithm for suspected traumatic bladder injuries significantly improves compliance with recommended plain or CT cystogram and reduces potential delayed or missed diagnoses.

Source of Funding: This project was supported in part by a generous reconstructive urology educational grant from American Medical Systems, Inc., Minnetonka, MN.
INCREASED OPERATIVE MANAGEMENT FOR BLUNT EXTRAPERITONEAL
BLADDER INJURY WITH DEDICATED GENITOURINARY TRAUMA SERVICE
HAS DECREASED RATE OF PERSISTENT URINARY EXTRAVASATION

Darshan P. Patel, B.S., James Morris, B.S.*, William O. Brant, M.D., James M.
Hotaling, M.D., M.S., Jeremy B. Myers, M.D.: Salt Lake City, UT
(Presentation to be made by Darshan Patel)

Purpose: Current trends are to manage the majority of extraperitoneal traumatic
bladder injuries conservatively with bladder drainage, allowing the injuries to heal
secondarily. We hypothesized that initial operative management of
extraperitoneal bladder injuries is underutilized and may decrease rates of
persistent urinary extravasation compared to conservative measures.

Methods: We identified patients presenting with traumatic extraperitoneal
bladder injuries at The University of Utah Hospital, a level 1 trauma center,
between 01/1996-01/2014. Multiple patient data points pertaining to injury
presentation and management were collected. Patients were excluded if they
had any component of intraperitoneal bladder injury. Our primary outcome was
the rate of persistent urinary extravasation for operative versus conservative
management for all extraperitoneal bladder injuries before and after the initiation
of a dedicated genitourinary (GU) trauma service at our institution.

Results: 43 extraperitoneal bladder injuries were identified: 27 between 1996-
2009 before a dedicated GU trauma service (cohort A) and 16 between 2010-
2013 after a dedicated GU trauma service (cohort B). Mean age was 46.6 yrs
and 43.6 yrs for cohort A and cohort B, respectively. Blunt trauma was the
predominant mechanism of injury for 100% in cohort A and 87.5% for cohort B.
The mean Injury Severity Score was 23.0 and 32.1 for cohort A and B
respectively (p=0.028). The leading concomitant injury was pelvic fractures in all
(100%) cases in cohort A and in cohort B. 24 patients in cohort A and 15 patients
in cohort B survived following initial presentation and had adequate follow-up to
assess for urinary extravasation. Operative management was performed in 8
(33%) cases in cohort A and 7 (47%) cases in cohort B. The rate of persistent
leak was 6/24 (25%) in cohort A and 0/15 (0%) in cohort B for both operative and
conservative management. For injuries managed operatively, the rate of
persistent leak was 1/8 (13%) and 0/7 (0%) for cohort A and B respectively.

Discussion: A dedicated GU trauma service along with advances in trauma care,
despite more severe injuries in older patients, has significantly decreased rates
of persistent urinary extravasations following extraperitoneal bladder injuries at
our institution. Our results suggest that a dedicated GU trauma service may
identify patients who are more likely to benefit from operative management.
However, evidence based data for the ideal treatment modality for
extraperitoneal bladder injuries is needed.

Source of Funding: This project was supported in part by a generous
reconstructive urology educational grant from American Medical Systems, Inc.,
Minnetonka, MN.
VALIDATION OF A VISUAL PROSTATE SYMPTOM SCORE IN MEN WITH LOWER URINARY TRACT SYMPTOMS
Rachel S Edlin, MD1, Pauline Filippou, BS1*, Thomas Chi, MD1, Catherine R Harris, MD1, Amjad Alwaal, MD1, Sarah D Blaschko, MD1, Benjamin N Breyer, MD1: 1San Francisco, CA
(Presentation to be made by Dr. Edlin)

Objectives: The International Prostate Symptom score (IPSS) is used to assess lower urinary tract symptoms (LUTS). The IPSS was designed to be self-administered by the patient, though prior studies have demonstrated the questions are difficult to understand, even for men who speak English and have a relatively high education level. This study seeks to evaluate the correlation between the IPSS and the Visual Prostate Symptom Score (VPSS), which is a questionnaire that uses pictures to assess LUTS and was developed by Dr. Adam E. Groeneveld, a urologist at Mbabane Hospital (Mbabane, Swaziland), and Stellenbosch University (Stellenbosch, South Africa).

Materials and Methods: Four IPSS questions related to frequency, nocturia, weak stream, and quality of life (QoL) were represented by pictograms in the VPSS. Men presenting to San Francisco General Hospital with LUTS were given the IPPS and the VPSS to be filled out without and then with assistance. We obtained patient demographic information including race, education level, literacy, occupation, and income. Peak and average urinary flow rates as well as an ultrasound-measured postvoid residual urine volume were obtained. Statistical analysis was performed using Chi-square and ANOVA.

Results: A total of 158 patients were enrolled (mean age 55 years, range 20 to 81 years) between December 2013 and May 2014. Of men enrolled, 19% identified as Black, 35% White, 27% Hispanic, and 13% Asian/Pacific Islander. The education level for Black, White, and Hispanic participants was grade ≤8 (0%, 1.8%, and 15.6%, respectively), grade 8-12 (41.9%, 17.5%, and 33.3%, respectively), and grade ≥12 (58.1%, 80.7%, and 42.4%, respectively). 65.2% of men reported being currently unemployed. Lastly, 11.7% of men reported being homeless (10.5% grade ≤8, 21.1% grade 8-12, and 68.4% grade ≥12). The mean absolute disagreement for participants who took the IPSS independently versus with assistance was greater than for those who took the VPSS independently versus assistance for those with education grade ≤8 (1.33 vs. 0.67, p=0.12), grade 8-12 (0.83 vs. 0.22, p=0.01), and grade ≥12 (0.56 vs. 0.26, p=0.01).

Conclusions: While the IPSS is designed to be self-administered, many men altered their responses when they received assistance with the questionnaire. This difference was significantly mitigated with the VPSS, suggesting the VPSS may be more useful particularly in patients with limited literacy and/or education.

Source of Funding: None
Introduction and Objective: Rates of pubic hair grooming continue to increase with recent studies showing that among women, incidence of pubic hair grooming ranges between 62.3-70.4%. Research suggests a correlation with increased pubic hair grooming rates and decreased incidence of pubic lice among men and women. These findings are in contrast to an increase among other STDs including gonorrhea and chlamydia over the same time period suggesting a causational relationship between pubic hair grooming and decreased rates of pubic lice. Pubic hair grooming has also been linked to increased rates of molluscum contagiosum virus. Despite the suggestion of correlation from these small-scale anecdotal studies, no large-scale survey has been performed to evaluate these hypotheses. We aim to focus on pubic hair grooming behavior and rates of sexually transmitted infection to elucidate the true risks and benefits related to pubic hair grooming.

Materials and Methods: A national web survey of men and women aged 18–65 years was conducted through GfK Custom Research, LLC’s Knowledge Panels, a probability-based web panel designed to be representative of the United States. Survey questions focused on pubic hair grooming behaviors, sexual behavior, and rates of sexually transmitted infections acquired by groomers.

Results: 7,570 subjects completed the survey, 55.5% men and 44.5% women. 72.9% of subjects groomed pubic hair, 66.5% men and 85.3% women. 11.8% of subjects reported a history of STD, 9.4% men and 14.8% women. Both men and women with history of STD were more likely to be groomers. Factors significantly associated with history an STD included increased number of sexual partners, increased self reported natural hairiness, white race, older age, higher education, single or divorced relationship status.

Conclusion: Incidence of STD among our sample was 11.8%. Groomers, regardless of biological sex, were more likely to have a history of STD. Further modeling is required to uncover whether a causational relationship exists between grooming and sexually transmitted diseases.
NON-STEROIDAL ANTI-INFLAMMATORY DRUG USE IS NOT ASSOCIATED WITH RISK OF ERECTILE DYSFUNCTION: DATA FROM THE PROSTATE CANCER PREVENTION TRIAL

Darshan P. Patel, B.S., Jeannette M. Schenk, Ph.D., R.D.*, Jeremy B. Myers, M.D., William O. Brant, M.D., James M. Hotaling, M.D., M.S.: Salt Lake City, UT
(Presentation to be made by Darshan Patel)

**Purpose:** Several cross-sectional studies have suggested an association between non-steroidal anti-inflammatory drug (NSAID) use and erectile dysfunction (ED); however, the temporal nature of these associations is unclear. Additionally, confounding by indication may affect associations of NSAIDs and risk of ED. We examined whether use of NSAIDs, when controlled for confounding by indication, was associated with risk of ED using longitudinal data from the Prostate Cancer Prevention Trial (PCPT).

**Methods:** 4,417 men from the placebo arm of the PCPT without ED at baseline were identified. Current NSAID use and medical conditions were assessed at baseline, and subsequently every 3 months on follow-up. Self-report of ED was collected by interview every 6 months and annually by administered assessments of sexual health. ED was defined as a decrease in normal function but ability to achieve vaginal penetration with difficulty (Grade 1) or no erections (Grade 3). Cox proportional hazard models with time-dependent exposures were used to calculate the relative hazards of incident ED associated with medical conditions and NSAID use. All proportional hazards models were adjusted for age, race, BMI, diabetes, marital and smoking status, and sexual frequency during the past 4 weeks. To evaluate the impact of confounding by indication, associations of NSAID use and ED risk were also adjusted for medical conditions associated with both NSAID use and ED.

**Results:** Indications for NSAID use, including arthritis, chronic musculoskeletal (MSK) pain, general MSK complaints, headaches, and sciatica were associated with the development of Grade 1 ED (HR: 1.34-1.55, p<0.0001-0.02), and general MSK complaints and headaches were associated with development of Grade 3 ED (HR: 1.22-1.48, p<0.0001-0.029). Any NSAID and non-aspirin NSAID use were associated with 14% and 16% increase, respectively, in Grade 1 ED risk and aspirin use was associated with a 24% increase in Grade 3 ED risk (Model 1: Table1). Control for indications of NSAID use attenuated all associations of NSAID use and ED risk (Model 2: Table 1).

**Discussion:** We found no association between NSAID use and risk of ED when confounding by medical indications for NSAID use was addressed. These results suggest that associations of NSAIDs and risk of ED are likely not causal, but rather the result of confounding by indication.

**Source of Funding:** UM1 CA182883-01(PCPT and SELECT Cohorts: Core Infrastructure Support for Cancer Research); Reconstructive urology educational grant, American Medical Systems, Inc., Minnetonka, MN.

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**Table 1: Associations of NSAID use with ED risk, n=4417**

<table>
<thead>
<tr>
<th>Grade 1 Erectile dysfunction</th>
<th>ED Events</th>
<th>HR</th>
<th>95% CI</th>
<th>P</th>
<th>HR</th>
<th>95% CI</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any NSAID use</td>
<td>460</td>
<td>1.14</td>
<td>1.03-1.27</td>
<td>0.01</td>
<td>1.09</td>
<td>0.99-1.22</td>
<td>0.09</td>
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<td>Aspirin use</td>
<td>195</td>
<td>1.09</td>
<td>0.94-1.27</td>
<td>0.24</td>
<td>1.08</td>
<td>0.93-1.25</td>
<td>0.32</td>
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<tr>
<td>Non-aspirin NSAID use</td>
<td>303</td>
<td>1.16</td>
<td>1.02-1.31</td>
<td>0.02</td>
<td>1.08</td>
<td>0.96-1.23</td>
<td>0.21</td>
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</table>

<table>
<thead>
<tr>
<th>Grade 3 Erectile dysfunction</th>
<th>ED Events</th>
<th>HR</th>
<th>95% CI</th>
<th>P</th>
<th>HR</th>
<th>95% CI</th>
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<tbody>
<tr>
<td>Any NSAID use</td>
<td>113</td>
<td>1.12</td>
<td>0.96-1.32</td>
<td>0.15</td>
<td>1.10</td>
<td>0.93-1.30</td>
<td>0.26</td>
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<tr>
<td>Aspirin use</td>
<td>61</td>
<td>1.24</td>
<td>1.03-1.53</td>
<td><strong>0.05</strong></td>
<td>1.23</td>
<td>0.99-1.52</td>
<td>0.06</td>
</tr>
<tr>
<td>Non-aspirin NSAID use</td>
<td>61</td>
<td>1.03</td>
<td>0.85-1.25</td>
<td>0.74</td>
<td>1.00</td>
<td>0.82-1.21</td>
<td>0.96</td>
</tr>
</tbody>
</table>

*Model 1: Adjusted for age (yrs, continuous), race (Caucasian, Other), BMI (kg/m²), diabetes, marital status (current, previous/never), smoking status (current/former, never), and sexual frequency (in past 4 weeks: none, 1-3 times per month, one or more times per week); *Model 2: Also adjusted for medical conditions associated with ED risk, *NSAID/Aspirin/Non-aspirin use lagged by 6 months*
RESECTION OF RETROCRURAL LYMPHADENOPATHY IN METASTATIC GERM CELL TUMOR VIA MIDLINE TRANSABDOMINAL APPROACH
Kamran Movassaghi, M.S., Hamed Ahmadi, M.D., Hooman Djaladat, M.D., Siamak Daneshmand, M.D.: Los Angeles, CA
(Presentation to be made by Dr. Daneshmand )

Introduction: Retrocrural (RC) masses are sometimes encountered in patients with metastatic germ cell tumors (GCT). Resection of these masses in conjunction with post chemotherapy retroperitoneal lymph node dissection (PC-RPLND) is a surgical challenge. RC masses are generally approached via thoracotomies or thoracoabdominal incisions. We present our experience with RC dissection during PC-RPLND using a midline transabdominal approach.

Methods: We used our IRB approved testicular cancer database to identify patients who underwent midline transabdominal approach to RC dissection between February 2011 and June 2013. Surgical approach, clinical characteristics, and peri-operative complications were assessed in this group of patients.

Results: RC dissection was performed in 7 patients by a single surgeon. The surgical approach on the right involves dissection of the medial aspect of the suprarenal vena cava, and opening the longitudinal fibers of the crus to access the retrocrural space. On the left access to the retrocrural region is obtained by dissecting the para-aortic area at the level of the superior mesenteric and celiac arteries and splitting the fibers of the crus. The average age of the group was 23 years (range 19-32) and all patients had stage III non-seminomatous GCT. 5/6 had bulky (> 5 cm) retroperitoneal disease. Besides RC masses, metastatic sites included the lungs, liver, and pelvis. One patient had IGCCCG good risk disease, 2 intermediate risk, and 4 poor risk. Histology of RC tumor revealed teratoma in 5 patients, necrosis in 1 and embryonal carcinoma in 1. Pathologic concordance between retrocrural and retroperitoneal pathology was 100%. Two patients had Clavien=3 complications (one partial SBO and one post-operative bleed requiring 2 units of blood transfusion). 4/7 patients, who had available follow-up with median of 23 months (range 9-34 months), had no evidence of recurrence.

Conclusion: Patients with bulky retroperitoneal disease may also present with retrocrural disease. Although retrocrural masses present a challenging location for resection, we found the midline transabdominal approach to be effective in select cases.

Source of Funding: None
ADIPOSE DERIVED STEM CELLS AND extracorporeal shock wave therapy for erectile dysfunction

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(Presentation to be made by Dr. Lander)

Objectives: Stromal vascular fraction (SVF) from lipo-aspirate is rich in adipose derived adult mesenchymal stem cells and cytokine growth factors. We evaluated the efficacy of intra cavernosal deployment of SVF combined with Low Intensity Shock Wave Therapy for the treatment of Erectile Dysfunction (ED) in 14 patients. Autologous SVF can be easily obtained and once deployed can be activated by cytokine signals released from tissue that is diseased, damaged, or inflamed. A limited series of low Intensity Shock waves create a controlled micro-trauma that is expected to be able to mimic these conditions and activate repair cells. SVF can be procured from a mini liposuction and then deployed within a few hours in the operating room as a type of lipo-transfer outpatient procedure performed under local anesthesia.

Methods: Fourteen men ages 27-73 with erectile dysfunction were selected. Three had associated Peyronies disease and three had documented venous leak. After IRB approved consent, Mini-liposuction (50cc) was performed. A closed system (TimeMachine™ by MediKhan) device was used for SVF procurement. Patients received a short series of low intensity shock wave treatments to the penis. SVF was deployed by intra-cavernosal injection. Patients were evaluated using Erectile Function scores (Questions 13 and 14 of IIEF) and EHGS scores at baseline and at 3 months.

Results: EHGS scores increased from mean 1.5 ± .83 to mean 2.36 ± .94. Mean Erectile Function IIEF scores increased in from 3.36 ± 1.9 to 5.79 ± 3.5. There were no adverse events.

Conclusion: Shock wave therapy combined with the intra-cavernosal deployment of adult mesenchymal stem cells from autologous SVF can improve sexual function in short term follow-up in a small group of ED patients. Cell based therapies in conjunction with low intensity shock wave therapy may have a role in the treatment of ED and further studies are needed to further elucidate the mechanism of action of SVF and determine the independent effects of the shock wave treatments, long term outcomes, and optimal shock wave settings.

Source of Funding: None
Purpose: Sexual dysfunction other than erectile dysfunction after definitive prostate cancer treatment is poorly understood. In this study we examine orgasm bother in individuals who have undergone definitive treatment for prostate cancer with either surgery or radiation and identify predictive factors.

Material and Methods: Surveys were sent to 906 individuals who underwent definitive management for prostate cancer including surgery and radiation. Questions regarding current sexual activity, presence of orgasm, as well as orgasm complaints including quality, problem, and pain were asked. Based on the type of treatment received we compared orgasm characteristics amongst these groups. A multivariate analysis was performed to identify treatment modalities which may predispose individuals to orgasm bother.

Results: 412 of the surveys were returned of which 329 were used in our analysis. 72% of these individuals were sexually active with 74% able to achieve orgasm. Those who underwent surgical intervention were more likely to be sexually active and experience orgasms after their treatment compared to those who underwent radiation therapy (76.4% versus 66.1%, p=0.05 and 78.6% versus 68.2%, p=0.04). The radiation group was also more likely to report pain with orgasm than the surgical group, 14.5% versus 3% p=0.001 respectively. When comparing post-treatment orgasm quality, severity of orgasm problem, and bother with change in orgasm after treatment there was no difference between the surgical and radiation groups; however, those undergoing surgical intervention perceived their overall orgasm function to be worse after treatment than those undergoing radiation treatment (64.3% versus 50.7%, p=0.05).

On logistic regression model predictive factors of orgasm bother were history of non-nerve sparing prostatectomy and combined brachytherapy with external beam radiation therapy (OR 2.57, 95% CI, 1.03-6.07, p=0.04 and OR 3.76, 95% CI, 1.29-10.93, p=0.02 respectively).

Conclusions: Orgasms worsen after treatment of prostate cancer with the type of treatment chosen being a dependent factor.
**Purpose:** The treatment of erectile dysfunction (ED) with inflatable penile prosthesis (IPP) in the immunocompromised patient has had limited study. A review of the literature revealed three series with conflicting results. We describe our recent experience in this complicated group with focus on results with currently available prosthetic devices.

**Materials and Method:** We identified 10 men with immunocompromised status (immunosuppression after solid organ transplant [n=7] or immunocompromised due to HIV [n=3]) who underwent IPP implantation between 2009 and 2012 and retrospectively reviewed their charts.

**Results:** The mean age was 58.8 (range 50-70), average length of stay was 1.28 days (range 1-2), and median American Society of Anesthesiologists (ASA) score was 3 (range 2-3). Two men had ED due to priapism while the rest had organic ED. 60% of the men had successful implantation in a single setting. Four patients required multiple surgeries. One underwent a staged corporal salvage for severe corporal scarring from priapism with semirigid implantation followed by IPP. Another presented with an infected IPP from an outside hospital (OSH) and developed infection after two subsequent replacements. The third had four prior IPP surgeries at an OSH with failed placement at the last setting. He required multiple reconstructions in order to place IPP cylinders. The final patient experienced infection after primary placement and required removal followed by a staged reimplantation. All patients ultimately had a functional prosthesis except for one man who desired only the cylinders after having had multiple prior procedures. The overall reoperation rate was 40%. The infection rate in the 18 surgeries was 22%. There were no intraoperative complications and no other postoperative complications with an average follow-up of 8.8 months (range 0-29).

**Conclusions:** This small series further demonstrates the feasibility of IPP in the immunocompromised patient, and demonstrates successful implantation in patients with HIV and prior solid organ transplantation. Primary implantation has a low complication rate. Patients with prior surgery and redo operations are at increased risk of complications. Patient selection needs to be carefully considered, but IPP should be included among the therapeutic options for immunocompromised men suffering from ED.

**Source of Funding:** None
FEASIBILITY AND SAFETY OF INFLATABLE PENILE PROSTHESIS IMPLANTATION AFTER ROBOTIC-ASSISTED RADICAL PROSTATECTOMY

AUTHORS: Patrick Ramos M.D., Eric Tygenhof, M.D., Mukul Patil, M.D., Stuart Boyd, M.D.: Los Angeles, CA

Presentation to be made by Dr. Ramos

Introduction and Objective: Erectile dysfunction after radical prostatectomy is common, and may have the same prevalence even when performed robotically. To our knowledge there are no studies examining the feasibility and safety of inflatable penile prostheses (IPP) in men after robotic-assisted laparoscopic radical prostatectomy (RALP).

Method: We retrospectively reviewed the charts of all men referred between 2010 and 2012 for post-prostatectomy ED after RALP; in that time period, 9 men underwent IPP implantation after RALP. We examined perioperative outcomes after IPP implantation by a single surgeon.

Results: The patients had a mean age of 65.1 (range 49-78) and a median American Society of Anesthesiologists score of 2 (range 2-3). Patients with persistent erectile dysfunction sought surgical correction at a mean of 42 months after RALP (range 6-80). Stability of carcinoma was confirmed prior to proceeding with IPP placement. All of the men had the IPP implanted through an infrapubic incision with reservoir placement in the retroperitoneal (n=7) or retropubic space (n=2). Three of the patients also had a history of adjuvant pelvic radiation. None of the men had intraoperative complications. After mean follow-up of 1.1 months (range 0-2) no post-operative complications were identified. All men with documented follow-up all had a functional prosthesis with a satisfactory result.

Conclusions: This early case series demonstrates the feasibility and safety of IPP implantation after RALP. In these cases, an infrapubic approach with a retroperitoneal reservoir was preferred due to the changes in retropubic anatomy after RALP. IPP should be considered a tool in the treatment armamentarium for post-RALP ED as it provides an opportunity for improved quality of life after prostatectomy.
SEMEN QUALITY OF WHITE AND ASIAN MEN SEEKING INFERTILITY EVALUATION

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(Presentation to be made by Dr. David Guo)

Purpose: While several studies have examined the semen quality of men in Europe and Asia, geographical and environmental factors can impact semen parameters, making genetic and cultural contributions difficult to evaluate. The purpose of this study is to compare the semen quality of white and Asian men seeking infertility care in the same region.

Materials and Methods: Men seeking evaluation for infertility at our fertility clinic between 2012 and 2014 provided a semen sample for analysis as a part of standard evaluation. Semen analysis included semen volume, sperm concentration, total sperm count, sperm motility, and sperm morphology. After stratifying based on race, we compared semen parameters as continuous variables and dichotomous variables (based on the WHO 5th edition criteria for subfertile parameters). Analyses were adjusted for age and year of evaluation.

Results: Our population consisted of 2,381 men seeking infertility evaluation, of whom 675 (28%) were white, 411 (17%) were Asian, and 1,294 (54%) either did not indicate race, or indicated another race. White men had higher average semen volume (2.9mL) than Asian men (2.7mL, p=0.02), but had lower average sperm concentration (61 million/mL) than Asian men (68 million/mL, p<0.01). The average total sperm count was similar between both groups (178 million). The percentage of motile sperm was higher in Asian men compared to white men (41 vs. 37%, p=0.01), as was the percentage of morphologically normal sperm (16% vs. 14%, p=0.05). When compared to the WHO reference standard, 14% of both white and Asian men had low semen volume (<1.5mL). The proportion of men with teratospermia (normal morphology<14%) was also similar between white and Asian men (49% vs. 45%, p=0.33). However, there were significant differences in the remaining parameters: 15% of white men versus 7% of Asian men had oligospermia (concentration <15 million/mL, p<0.01). In addition, 54% of white men and 45% of Asian men had asthenospermia (motility<40%, p<0.01).

Conclusions: A higher percentage of white men than Asian men seeking infertility evaluation had oligospermia and asthenospermia. These findings may represent differences in inherent sperm production or in the care-seeking behavior between races. Further investigation of these disparities is warranted, as they may clarify prognosis and guide future treatment.
COMPARING MEN SEEKING INFERTILITY EVALUATION AND THOSE UNDERGOING VASECTOMY: FROM THE NATIONAL SURVEY OF FAMILY GROWTH

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(Presentation to be made by Darshan P. Patel)

Purpose: Single-institution cohort studies, which comprise most studies in male infertility, have limited generalizability to the true male infertility population. Nearly an equal number of men between the ages of 18-45 yrs seek infertility care as those that undergo a vasectomy in the United States. Although these two groups seek medical care for very different reasons, differences in demographic and socioeconomic factors between these two groups will help characterize the true male infertility population. We present a cohort study using data from the CDC National Survey of Family Growth (NSFG), a national household survey of respondents between 15-45 years old, comparing men seeking infertility evaluation versus those who had a vasectomy.

Methods: Data from Cycle 5 (1995), Cycle 6 (2002) and Cycle 7 (2006-2008) of the NSFG was reviewed. The overall response rate for the survey was 75%. The diagnosis of infertility was assessed with several questions administered in the NSFG, addressing “going to the doctor or other medical care provider to talk about ways to help you have a baby?” Diagnosis of vasectomy was assessed through several questions addressing “have you ever had any operation that makes it impossible for you to father a child and was it a vasectomy?” Variables analyzed included age (<30, 30-39, ≥40), marital status, self-reported ethnicity, educational attainment, income level (less than $75,000 or greater than $75,000), and insurance status. Our primary outcome was correlation of these demographic and socioeconomic factors with evaluation for male infertility or vasectomy using chi-squared analysis.

Results: Of the 11,067 men were identified through the NSFG, 466 (4.2%) men presented for infertility evaluation and 326 (2.9%) had a vasectomy. In comparison to men presenting for infertility, those who had a vasectomy were older and already had multiple children (p=0.001,0.001). Men who had a vasectomy vs. presenting for infertility were more likely to be currently married (78% vs. 74%, p=0.010) and Caucasian (86% vs. 70%, p=0.001). Interestingly, men who had a vasectomy were less likely to have a college level degree compared to men presenting for infertility (64% vs. 68%, p=0.015). There was no significant difference between BMI, religion, income, or insurance status between the 2 groups.

Discussion: Higher-level education but not income or insurance status is significantly associated with men seeking infertility care when compared to men undergoing a vasectomy. Other socioeconomic factors are similar. Further research identifying the association of specific demographic and socioeconomic factors with male infertility is needed.

Source of Funding: This project was supported in part by a generous reconstructive urology educational grant from American Medical Systems, Inc., Minnetonka, MN.
Introduction: Varicoceles are commonly left sided. The classical teaching is that right varicocele should be evaluated with imaging, as there must be a pathologic reason. We challenge that imaging is not required as significant findings are rare.

Materials and Methods: We retrospectively reviewed all varicoceles seen at our institution from January 2010—June ‘13. Patient charts were identified by querying ICD-9 code for varicocele (456.4). We then reviewed charts to see if imaging was performed to see if pathology was present.

Results: A total of 246 patients with the diagnosis of varicocele were seen at our institution. One hundred forty-eight were left, 17 right, and 81 bilateral. Sixty-six (26.7%) patients underwent imaging for further evaluation. More patients with right varicoceles underwent abdominal imaging than others. Higher BMI and laterality were found to be significant on univariate analysis but were not significant on multivariate analysis. No patients with right varicoceles had pathology. None of the patients with pathology had pathology that explained the varicocele.

Conclusions: Our data questions the belief that imaging is necessary in patients with right varicoceles as none of our patients had pathology. We advocate the following in patients with right varicoceles: a cardiac examination in patients younger than 40 years old given the reports of situs inversus, 2. an abdominal exam in order to identify palpable abdominal masses, and 3. an abdominal ultrasound in patients older than 40 years old with new onset or any adult with large (grade 3) right sided varicocele.
SAFETY AND EFFICACY OF CLOMIPHENE CITRATE IN MEN: A RETROSPECTIVE, COHORT STUDY


(Presentation to be made by Darshan Patel)

Purpose: Clomiphene citrate (CC), originally approved for women, is used routinely for male infertility and hypoandrogenism. We present a single-institution, retrospective cohort study determining effects of CC on hormones levels and semen parameters in men, identifying baseline characteristics predictive of a positive response to CC. Additionally, we assessed the safety profile of CC and determine the rate of paradoxical or non-responders.

Methods: We identified patients presenting to our institution who were placed on CC, 50 mg every other day, for male infertility and/or symptomatic hypoandrogenism between 9/2013-5/2014. Patients with documented exogenous testosterone, HCG, or anastrozole use within 2 weeks of baseline labs were excluded. Our primary outcomes were the effects of CC on hormone levels and semen parameters. Secondary outcomes include the predictive potential of baseline Androgen Deficiency in Aging Males (ADAM) questionnaire, Sexual Health Inventory for Men (SHIM) score, BMI, varicocele presence, hormone levels and semen parameters on response to CC.

Results: Of the 57 patients who met our selection criteria, 34 males with adequate follow-up were included. Mean age and body mass index was 34.9 yrs and 29.7, respectively. Mean baseline FSH, testosterone, bioavailable testosterone (BAT) and estradiol were 10.8 IU/l, 246.8 ng/dL, 125.5 ng/dL, and 20.8 pg/dL, respectively. After 2 weeks of treatment, mean testosterone, BAT, and estradiol increased to 527.6 ng/dL, 281.8 ng/dL, and 32.0 pg/dL (all p<0.001). Two (6%) patients had a paradoxical decrease in total testosterone at two weeks and were switched to hCG. After median follow-up of 3.0 months (IQR: 2.3-3.7), mean total testosterone in our cohort (n=14) had increased to 584.9 ng/dL (p<0.001). Mean PSA and hemoglobin was 0.99 ng/mL (SD: 0.45) and 16.1 g/dL (1.45). In patients with semen analysis (n=10), mean ejaculate volume, percentage progressively motile, and percentage of normal morphology was similar at 3 months vs. baseline. However, mean total motile count and concentration increased to 90.9 million and 72.5 million/mL at 3 months from 24.3 million and 28.5 million/mL at baseline, respectively, although these findings were not significant (p=0.09, 0.09). No patients experienced a paradoxical decrease in total testosterone at two weeks and were switched to hCG. After median follow-up of 3.0 months (IQR: 2.3-3.7), mean total testosterone in our cohort (n=14) had increased to 584.9 ng/dL (p<0.001). Mean PSA and hemoglobin was 0.99 ng/mL (SD: 0.45) and 16.1 g/dL (1.45). In patients with semen analysis (n=10), mean ejaculate volume, percentage progressively motile, and percentage of normal morphology was similar at 3 months vs. baseline. However, mean total motile count and concentration increased to 90.9 million and 72.5 million/mL at 3 months from 24.3 million and 28.5 million/mL at baseline, respectively, although these findings were not significant (p=0.09, 0.09). No patients experienced a paradoxical decrease in total motile count or concentration while on CC. Two (14%) patients discontinued CC at 3 months: 1 due to side effects and 1 who experienced a large decline in total testosterone. Adverse effects including fatigue and mood symptoms were mild and reported in 5 (15%) of patients. FSH levels below 6.5 IU/l were associated with a lower increase in total testosterone at 2 weeks (mean Δ =241.8 ng/dL, p=0.001) as well as lower increase in BAT levels (mean Δ =66.1 ng/dL, p=0.08). On age-adjusted regression analysis, age, BMI, longitudinal testis axis, baseline FSH, LH, and estradiol did not significantly correlate with improvement in BAT at 2 weeks.

Discussion: CC is a safe and viable option for male infertility and/or hypoandrogenism that improves testosterone and may improve total motile count and semen concentration. Furthermore, a small but significant portion of men on CC may not demonstrate improvement in testosterone. Lower baseline FSH may predict less improvement in testosterone levels on CC.

Source of Funding: This project was supported in part by a generous reconstructive urology educational grant from American Medical Systems, Inc., Minnetonka, MN.
MALE FACTOR INFERTILITY AND CLOMIPHENE CITRATE: A META-ANALYSIS

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(Presentation to be made by Vera Trofimenko, M.D., M.A.S.)

Purpose: Clomiphene citrate administration has long been used with inconclusive outcomes as an often empiric treatment for male factor infertility, presumably by increasing sperm concentration. However, a meta-analysis of the exact impact on semen parameters remains to be performed. Our study aims to perform a systematic review and meta-analysis of the impact of clomiphene citrate on sperm parameters for men with male factor infertility and oligospermia.

Materials and Methods: Systematic review of pertinent randomized controlled trials (RCT) and prospective trials (PT) was performed using the bibliographic databases MEDLINE (1966-2013), EMBASE (1980-2013), and Cochrane Collaboration. References of selected articles identified were reviewed for additional relevant citations. The net treatment effect was analyzed using standard meta-analysis methods.

Results: Data pooled from two RCTs and one PT of men with infertility and oligospermia included a total of 197 males with mean age 32.8 years (range 18-65), 115 in the treatment arm treated with a minimum of 25mg clomiphene citrate (CC) daily for at least three months and 82 in the placebo or no treatment arm. Pooled data meta-analysis demonstrated a highly significant increase of 7.7 Million/ml in sperm concentration after clomiphene citrate compared to placebo or no treatment. There was no evidence for significant heterogeneity across groups.

Conclusions: Our analysis of pooled data from the meta-analysis demonstrated that clomiphene citrate (CC) is associated with an increase in sperm concentration compared to placebo in men with male factor infertility. Results to date are consistent with the proposed mechanism of action in which these improvements reflect normalization of the HPG axis. Quantification of the magnitude of this effect can be employed by reproductive specialists to counsel patients with male factor infertility.

Source of Funding: None
Purpose: Vasectomy for male sterilization is the most common urological procedure performed in the United States, with failure rates ranging from 0.01% to 5% in the literature. Prior to 2014, our definition for post-vasectomy occlusive success was azoospermia. However, the AUA 2012 vasectomy guidelines defined post-vasectomy success as either azoospermia or rare nonmotile sperm (RNMS) in a single uncentrifuged PVSA, with rare defined as 100,000 or fewer nonmotile sperm per ml. The impact of the inclusion of RNMS in defining success has been shown by Coward, et al. to simplify post-vasectomy follow-up, improve patient compliance and help avoid unnecessary PVSA and repeat vasectomies in a population of civilian males. In contrast to the civilian sector, our patient population is comprised mainly of active duty service members, who are rapidly deployed and highly mobile. Our study sought to evaluate the impact of the 2012 AUA Vasectomy guidelines on our post-vasectomy clinical outcomes and compare them with their civilian counterparts. We hypothesized that military patients’ overall compliance with post-vasectomy follow-up is less than that of their civilian counterparts, and that application of the 2012 PVSA criteria for success may significantly impact postoperative follow-up by improving compliance rate, allowing for earlier return to intercourse without another means of birth control, and cut costs.

Materials and Methods: We retrospectively reviewed records of 869 men who underwent vasectomy at our military hospital between January 2011 and December 2013. Of these men, 453 (52%) provided at least one PVSA and were further analyzed to determine compliance with follow-up and the time between the procedure and occlusive success documented by PVSA. Records of men who were not azoospermic by the first PVSA were further reviewed to determine whether repeat PVSA and/or repeat vasectomy were performed. Occlusive success rates for our post-vasectomy military patients were compared using the older definition requiring azoospermia versus the 2012 AUA vasectomy guidelines definition of success that includes RNMS. Occlusive success rates and the change in rates were estimated along with 95% confidence intervals. The mean and median days to occlusive success were compared between the old and new guidelines. Healthcare cost savings related to the new metric of post-vasectomy success was also calculated.

Results: A total of 869 service members underwent vasectomies between January 2011 and December 2013. Of these, 416 (48%) failed to submit an initial PSVA, leaving only 453 (52%) men who returned to provide at least one PVSA. Of the 453 men who submitted an initial PVSA, 346 (76%) were azoospermic, 85 (19%) had RNMS, 1 (0.2%) had greater than 100,000 nonmotile sperm present per ml, and 21 (4.6%) had motile sperm. Defining our success as azoospermia on first PVSA resulted in a success rate of 76% (failure rate of 24%). Moreover, of the 107 men with persistence of sperm on PVSA, 49 (46%) never returned for a second PVSA. Of the 58 men who returned for a second PVSA, 40 (69%) were subsequently azoospermic, 16 (28%) had RNMS, and 2 (3%) had motile sperm in their ejaculate. The mean time between the first and second PVSAs was 96 days (median 75 days). If success after vasectomy is defined by azoospermia on PVSA, then our occlusive success rate was only 39.8% (346/869 men). However, this rate is more reflective of the high rate of noncompliance with post-vasectomy follow-up, with nearly half of our service members never returning for an initial PVSA. Although our population is highly mobile, this noncompliance rate was similar to the civilian cohort at Baylor, where only 56% of civilian patients returned for at least 1 PVSA. Subgroup analysis of the 453 men who complied with submission of an initial PVSA revealed initial occlusive success in only 346 (76%) when defining success as azoospermia, but using the 2012 definition, sterility was achieved in 431 men (95%) after initial PVSA. Inclusion of RNMS in our definition of success would have allowed 85 men in our cohort to forego the need for a second PVSA (a savings of over $2550 in laboratory fees alone) as well as to return sooner to intercourse without an alternative means of contraception. No patients underwent repeat vasectomy for persistent RNMS and no unintended pregnancies were documented.

Conclusions: The military population offers unique challenges to urologists, as continuity of specialty care is difficult to maintain when soldiers are relocated and deployed. Despite this, compliance with submission of PVSA was similar to civilian counterparts. Application of the 2012 AUA post-vasectomy guidelines for defining occlusive success has the potential to improve the documented success rate, simplify follow-up and reduce costs by decreasing the number of PVSAs required, and allow for earlier return to intercourse without an alternative means of contraception.

Source of Funding: None
SURGICAL MANAGEMENT OF MASSIVE SCROTAL LYMPHEDEMA
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(Presentation to be made by Dr. Van Lierop)

Objectives: Lymphedema of the male external genitalia is a rare disease. With the growing prevalence of morbid obesity, an entity known as massive localized lymphedema (MLL) was recognized in 1998. Previous reports have described techniques for the excision of scrotal lymphedema of various etiologies, but there have been no case series to date that focus on excision of MLL of the scrotum. Our series highlights particularly challenging cases, as their size exceeds that of any in the literature.

Methods: A total of 5 patients underwent complex reconstruction of MLL of the scrotum between 2008 and present. An incision was made in the midline of the scrotum, and this was continued posteriorly until the penis was located. The dissection was then carried laterally to isolate the spermatic cords and testicles. Posterior and lateral skin flaps were used for primary closure.

Results: Mean (range) patient age was 48 years (34-58). All patients were morbidly obese with mean pre-operative BMI of 57.8 kg/m² (43.7-68.2). Mean specimen weight was 22.2 kg (0.4-60). Mean follow up time was 31 months (5-64). Three patients had recurrent lymphedema, and two underwent a second procedure to remove additional tissue. All patients had improvement in quality of life.

Conclusions: MLL is a rare condition that most commonly affects the extremities, but can also affect the scrotum. MLL is associated with morbid obesity, and one theory of its causation is that a massive abdominal pannus obstructs the lymphatic flow. Patients are often advised on weight loss to alleviate the obstruction. Although this may help prevent further progression, it will not help with the lesion itself, and surgical resection is the treatment of choice. There have been several case reports of surgical resection of MLL in the literature, but our series is unique due to the massive size. Several of our patients had recurrent lymphedema, and two required skin grafting on repeat resection; this was consistent with previous reports. Our series demonstrates that surgical resection of MLL of scrotum is not only feasible, but can be met with excellent outcomes, even in cases of extraordinary proportions.

(Presentation to be made by Dr. Hu)

Purpose: Management of testicular cancer has evolved worldwide and indications for local therapies, such as retroperitoneal lymph node dissection (RPLND) are currently more limited. Differences in patterns of care and utilization of RPLND may exist between different types of hospital and may also reflect accessibility to this treatment modality and/or compliance to national guidelines. Since there are no population-based reports in the US that measure the utilization of RPLND, we sought to characterize its use and stratify according to the type of hospital.

Methods: The National Cancer Data Base (NCDB) was queried for patients with seminoma or non-seminoma (includes mixed histology) testicular cancer, between 1998 and 2011. The rates of RPLND were calculated for each stage of the disease and were later stratified according to the treatment facility type, namely, community, comprehensive and academic centers. Results were obtained by cross-tabulation, proportions were compared with the chi-square test, and trends assessed with the Cochran-Armitage test.

Results: Within the NCDB, of 59,652 patients with testicular cancer, 5475 (9.2%) underwent RPLND. The utilization of RPLND varied significantly different between the types of facility across all stages (Figure) and the highest rates of use were recorded in academic centers (all p<0.001). For example, in Stage III non-seminoma, RPLND rates for community, comprehensive and academic centers were 8, 10 and 25%, respectively. Trends over time have shown an increase use of RPLND in academic centers and a significant decrease in community centers, especially for Stage I and Stage III non-seminoma (all p<0.001).

Conclusions: In the US, use of RPLND varies significantly according to type of treatment facility, and these differences increased during the last decade. Further studies are needed to address the potential effect of these differences on survival outcomes.

Figure
NATIONAL RISK FACTORS AND ESTIMATED COSTS FOR URETERONEOCYSTOSTOMY AFTER PEDIATRIC RENAL TRANSPLANT

(Presentation to be made by Dr. Godebu)

Introduction: About 800 pediatric renal transplants are performed yearly in the U.S. Following renal transplant, ureteral reimplantation (ureteroneocystostomy) may be secondary to vesicoureteral reflux or obstruction. Small studies have identified several risk factors. We aimed to examine these and other possible risk factors, as well as cost, for requiring open ureteroneocystotomy following renal transplant in children using a large, national database.

Methods: Data was extracted from the Pediatric Health Information Systems (PHIS) database between January 2004 and June 2012. We examined the association between demographics, comorbidities, genitourinary conditions, insurance status and hospital characteristics to performance of ureteroneocystotomy following renal transplant. We also looked at the relative costs. Descriptive and comparative statistics were performed including unadjusted and adjusted Cox regression.

Results: A total of 2390 pediatric patients underwent renal transplant over 8 ½ years. Of these, 69 (2.3%) underwent post-transplant ureteroneocystostomy at a median of 11.6 months post-transplant with a plateau at 5 years. After adjusting for confounders, risk factors for ureteroneocystostomy included younger age (p=0.048), posterior urethral valves (PUVs) (p<0.001), female gender (p=0.005), race (p=0.014), insurance type (p<0.027), region (p=0.045), and transplant surgery volume (p=0.048). Finally, ureteroneocystotomy at the time of transplant or after transplant does not significantly increase the total cost of transplant (p=0.854 and p=0.175, respectively).

Conclusion: Using a large, national database, we confirmed previous findings by small studies that younger age and PUVs increase the risk of post-transplant need for ureteroneocystotomy. In this large patient population, most occur within one year and few occur after five years. We demonstrate an association between risk and gender, race, socioeconomic factors such as insurance status, and hospital characteristics. Finally, subsequent ureteroneocystotomy does not significantly increase overall cost of individual treatment. This information can help to guide patient selection, follow up, and management of patient expectations.

Source of Funding: None
PAIN IN LL-37 INDUCED BLADDER INJURY
(Presentation to be made by Dr. Oottamasathien)

Purpose: Innovative mouse models that elicit bladder specific pain are needed. We’ve previously demonstrated the naturally occurring urinary anti-microbial peptide LL-37 can induce profound bladder inflammation. Our specific aim was to establish the pain profile associated with LL-37 induced bladder injury. We first hypothesized that pain responses escalate in a dose dependent fashion. We further hypothesized that a single exposure to LL-37 yields prolonged pain responses. Finally, we hypothesized LL-37 induced bladder injury demonstrates pain responses that are independent of inflammation.

Materials and Methods: To test our first hypothesis, adult female C57Bl/6 mice were placed under anesthesia, catheterized, then challenged with 50μL of LL-37 for 1 hr, over six logarithmic concentrations of LL-37 (10, 20, 40, 80, 160, 320 μM; n=5 for each [ ]). Controls consisted of sterile saline. Baseline pain responses with von Frey filaments at five different forces (0.04 gm to 4.0 gm) were performed on all mice prior to LL-37 instillation and 24 hours after instillation of LL-37. Animals were subsequently sacrificed and bladders harvested. Our second hypothesis was tested by challenging with LL-37 for 1 hr at a single concentration of 320 μM (50μL instillation volume). Baseline pain responses were performed prior to LL-37 instillation. Pain assays and tissue harvest occurred at 5 different time points (1, 2, 3, 5 & 7 days, n=5 for each time point). To test our final hypothesis, tissues from both the dose response and time course experiments were subject to tissue myeloperoxidase (MPO) assays to quantitate levels of inflammation, as well as gross and microscopic histologic examination. MPO levels were then compared to overall pain responses. Statistical methods for the respective experiments included: Wilcoxon signed-rank, one-way ANOVA, Bonferroni adjustment (p<0.05 significance level, SAS v9.2 software).

Results: For both the dose response and time course experiments, baseline pain responses increased as expected as a function of force applied using the graded filaments. The dose response experiment demonstrated a graded pain response, with higher concentrations of LL-37 challenge yielding higher pain responses across all filaments tested. Statistical significance was seen when comparing 1.0 gm von Frey filament results at 320 μM (68% response) vs. 0 μM (18% response). The time course experiment demonstrated similar pain responses for the 1, 2, and 3 day groups. Interestingly, pain responses did not attenuate across time, but were significantly higher at 5 and 7 days, when compared to the earlier time points (1, 2, and 3 days). When evaluating MPO data for the dose response experiment, only 320 μM of LL-37 challenge demonstrated substantial elevation suggesting pain responses could be independent of inflammation. MPO data for the time course experiment demonstrated the highest values in the 2 day group, with minimal MPO levels seen in the 5 and 7 day animals. These results were again suggestive that pain is independent of local bladder inflammation.

Conclusions: We innovatively demonstrated within our surrogate model that a naturally occurring biologic compound in the bladder could elicit pain in a dose dependent fashion. Furthermore, LL-37 appears to elicit pain responses that persist beyond the initial point of insult. Finally, both our dose response and time course experiments demonstrated that pain responses were independent of inflammation. These findings further substantiate the physiological relevance of our biologic, non-infectious, and non-chemically induced bladder injury model.

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SUCCESSFUL PREGNANCY IN PATIENTS WITH EXSTROPHY-EPISPADIAS COMPLEX
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(Presentation to be made by Dr. Dy)

Introduction: Epispadias-exstrophy complex (EEC) is frequently associated with müllerian anomalies. This is a complex medicosurgical problem that requires a specialized team approach from preconception counseling to delivery. This study aims to describe and reflect upon this experience at our institution.

Materials & Methods: A retrospective review was performed over 15 years, evaluating EEC patients who have carried successful pregnancies. A description of their prior reconstructions and comorbidities is included. Also described is their pregnancy course, antenatal and postnatal outcomes including urologic and obstetric complications. Inclusion criteria: patients with EEC with a history of complex genitourinary reconstruction who have had successful pregnancy between 1996-2014, age >=18 years. Exclusion criteria: patients with genitourinary anomalies other than EEC; minors. IRB approval was obtained.

Results: Seven women with EEC had 12 pregnancies resulting in 9 live births; the other 3 resulted in fetal loss or abortion. All were naturally conceived. Complications during the 9 pregnancies included recurrent urinary tract infection in 6, difficulty catheterizing per Mitrofanoff channel in 2, with complete obstruction requiring nephrostomy drainage in one. Seven neonates were delivered by planned cesarean section, one emergently; one was delivered vaginally at an outside institution. There were two preterm deliveries; the remainder carried to term. There were no major surgical complications at the time of each delivery.

An algorithm for treatment is described. This begins with preconception counseling and early pregnancy planning involving the high risk obstetrician and urologist. An understanding of the patient’s reconstructed anatomy is important. Discussions about routine obstetric and gynecologic care, and unique risks of infection, obstruction, and changes in continence are initiated. Patients are counseled on the likelihood of requiring planned cesarean section via classical uterine incision. Whether the patient has urinary tract colonization vs. infection must be established early, treating more conservatively in patients with prior recurrent UTIs or complications. In the second and third trimesters, consequences of an expanding gravid uterus arise, including changes in the ability to self-catheterize through reconstructed channels. Surgical approach for C-section is described, with key utilization of the Alexis O C-section Retractor which provides circumferential atraumatic resection. The delivery is usually a planned cesarean at 37-39 weeks in an operating room with full surgical capacity, with both Materal Fetal Medicine (MFM) and Urology present.

Conclusions: Women with epispadias-exstrophy complex can have full reproductive lives, though at higher risk for spontaneous abortion, as shown by our experience. According to Center for Disease Control data, there was 1 spontaneous abortion per every 6-7 births in the general population in 2008. There was 1 abortion per every 3 births in our cohort. Our patients’ pregnancies were planned when possible and followed closely by dedicated specialists in MFM and urology. Surgical delivery of EEC patients has become less challenging with increased standardization of pediatric reconstructive approaches. The Alexis Retractor has significantly improved exposure during cesarean section. The algorithm described has evolved from the experiences caring for these women through each step of pregnancy, preempting and treating complications, and delivering their babies safely.

Source of Funding: None
WHAT IS THE RISK OF HYPERTENSION IN THE PEDIATRIC POPULATION AFTER HIGH-GRADE RENAL TRAUMA?

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Purpose: It is generally accepted that there is a risk of long-term hypertension after renal trauma, particularly high-grade and devascularizing renal trauma. The exact incidence and risk of this, however, is not well understood. In our review of the literature, there were no series describing the rate of hypertension after trauma. The purpose of our study was to evaluate a large cohort of high-grade pediatric renal trauma and determine the incidence of hypertension.

Materials and Methods: We performed retrospective review of all pediatric renal trauma patients at Primary Children's Medical Center in Salt Lake City, Utah between 2002 and 2012. We included all children, age ≤ 16 yrs old with grade 3, 4 or 5 injuries to the kidney. Because blood pressure varies with age in children, we defined hypertension after renal trauma as a child with hypertension requiring close follow up, hypertension present immediately after trauma that persists or hypertension not present immediately after trauma but that presents on follow up in delayed fashion. All children had a thorough chart review including any nephrology follow up, clinic or hospital notes with any mention hypertension to better understand the post-trauma course for each patient.

Results: A total of 63 children were identified with grade 3, 4 or 5 renal injuries. Twenty three children had reliable follow up blood pressures. Of these, 8 were grade 3, 14 were grade 4 and 1 was grade 5. Our average follow up was 3.8 (1 – 8.4) yrs. 21% (5/23) children had some degree of hypertension after renal trauma. One of these injuries was grade 3, 3 were grade 4 and 1 was grade 5. One child had hypertension not requiring medication and remained normotensive at follow up. Three required medication temporarily but were weaned off and are normotensive at follow up. One child, a grade 4 injury, remains on anti-hypertensive medications at follow up. No children developed hypertension in a delayed fashion on follow-up. All children in our series with hypertension presented immediately after trauma. A total of 17.4% of children required medication for treatment of hypertension but only 4.4% required long-term anti-hypertensive medication.

Conclusions: The risk of hypertension after renal trauma is real. Twenty-one percent of children in our series developed some degree of hypertension that required follow up or medication. If a child is going to develop hypertension, it seems as though it will present immediately after trauma rather than in delayed fashion. A small percentage of children require long-term pharmacotherapy for hypertension after high-grade renal trauma.

Source of Funding: None
Background: BC Children’s Hospital is the only Canadian pediatric center participating in NSQIP along with over 50 others in the US. Our hospital was found to have 2.5 times higher rates of 30 day postoperative UTIs when compared to the mean rate of other pediatric centers. We addressed this problem using multiple faceted approach for quality improvement projects.

Method: UTIs were diagnosed based on Center for Disease Control criteria adopted by NSQIP. Between 2012-2014, 2793 patients were followed at least for 30 days as per NSQIP protocol. An in depth analysis of institutional data using univariate and multivariate analysis showed indwelling urethral catheters and surgery by certain sub-specialties to be associated with higher rates of UTI. We also used LEAN methodology to engage frontline health care workers in the quality improvement activity. This group identified perineal care as an area requiring improvement. Practice changes were introduced including daily perineal care using disposable sponges, education session on catheter care and clinical pathways aimed at reducing catheterization in high incidence groups. The incidence of UTI before and after the introduction of this bundle was compared.

Results: Before the introduction of the bundle the UTI rate was 1.8% (23/1307) with an odds ratio of 2.5 compared to other NSQIP hospitals. Following introduction of bundle this rate dropped to 0.4% (6/1486, p=0.0005). Although the proportion of catheterized patients did not differ, the dwell time was in average 1 day shorter in the high-risk groups (2 vs 3 days). The perineal care protocol was performed in 70-80% of patients.

Conclusions: NSQIP is an effective tool in identifying areas of surgical care that require improvement by benchmarking the performance of each center. Data driven multi-prongs approach to quality improvement has shown remarkable results in reducing post-operative UTIs.
A STANDARDIZED WEB-BASED TEMPLATE FOR UROLOGICAL PROCEDURES: A PLATFORM FOR CONTINUOUS PROCESS IMPROVEMENT

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(Presentation by Dr. Willihnganz-Lawson)

Purpose: Current operating room practices are not standardized and involve the use of individualized preference cards that are often out-dated and lack visual aids for operating room staff. We hypothesize that a standardized web-based operating room module will minimize operating room redundancy, improve efficiency, reduce cost and provide a platform for continuous improvement.

Materials and Methods: All patients aged between 6 months and 5 years of age from June to November 2013 undergoing unilateral orchiopexy, unilateral inguinal hernia repair and distal hypospadias repair were included in the study. This excludes any patient who underwent bilateral or multiple other procedures. These three operative procedures were standardized by creating web-based templates that defined steps of the operation including visual aids of mayo stand and room setup. These templates were displayed in the operating room throughout the procedures and made available to all surgical staff. Variables evaluated include total procedure time, extra supplies utilized, number of nursing trips outside the room to deliver supplies not available, and total charges. Baseline data was collected 3 months prior to and 3 months after implementation. We also conducted a validated 10-item usability survey to physicians and staff on the current preference card system before implementation, and then on the standardized web-based template after implementation. Statistical analysis of the data was performed using Student t test and Wilcoxon-Mann-Whitney test for nonparametric data.

Results: A total of 59 patients were evaluated, 29 patients in the baseline group (12 orchiopexy, 9 hypospadias, 8 hernia) and 30 patients in the comparison group (13 orchiopexy, 8 hypospadias, 9 hernia). After implementation of the CEVL module, the system usability scale scores improved from below 10th percentile to above average 80th percentile (from 52.9 to 75.3 +/- 20, p<0.05). Total in room times were not significantly different after implementation of the platform for all three procedures. There was a decrease in number of extra supplies used following implementation of the template. Total charges were decreased by a mean of $2,015 per case, but this did not reach statistical significance.

Conclusions: A standardized surgical module even for common urological cases improves operating room efficiency, shows a possible decrease in cost, is preferred to current preference card system, and is user-friendly. Further studies are needed to determine the efficacy of such a standardized system, especially for longer and more complex procedures.

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