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UP-028
Surgical Postoperative Complications after Open Radical Cystectomy: Using a Standardized Classification

Autrán Gómez Ana Maria, Izawa Jonathan, Al-Zahrani Ali, Chin Joseph
Department of Urology, University of Western Ontario, London Health Sciences Centre, London, ON, Canada

Introduction and Objective: Open radical cystectomy (ORC) with pelvic lymphadenectomy is considered the gold standard treatment for patients with invasive bladder cancer, providing excellent local cancer control. However, ORC is considered one of the most complex urologic surgical procedure, with followed by significant peri-operative complications and high mortality rates that are dependent on length of postoperative follow-up. In the literature, peri-operative complications following ORC have been reported in many series, but few studies have used a standardized system of classification and that inconsistency has hampered accurate comparisons between different series. The aim of this study was to classify the peri-operative surgical complications with longer follow-up and identify the risk factors for complications, in patients who underwent ORC using a standardized reporting with the (Clavien grading system) in the experience of a single surgeon.

Methods: The operative and post-operative records on 263 consecutive patients submitted undergoing ORC between January 2001 to January 2010 were retrospectively collected. All cases were performed by single surgeon (JI) using a standardized technique. The complications were identified and graded according to Clavien system, which is based on severity (Grade 1-2) and (Grade 3-4). The different variables were studied to determine if there were any associations with the complications. Mann-Whitney U test signed rank test was used ($p<0.05$ significant). Stepwise conditional logistic regression was performed using package (Graphad Instat 310, Chicago IL, USA).

Results: 164 complications were identified in 78 (30%) patients, where 113 (69%) complications occurred within 90 days of surgery and 51 (31%) after 90 days. General patient characteristics of population are shown in Table 1. 44 (27%) of patientsopulation showed had the highest grade of complications (3-4) and 119 (72%) had minor grade (1-2) complications. Gastrointestinal, infectious and genitourinary complications were the most common (42%, 15% and, 12% respectively). At 90 days, the mortality rate was 1%. On univariable analysis the operative time, estimated blood loss, pathologic stage and lymph node dissection were not associated with the rate of complications. At multivariable analyses, only BMI was an independent significant negative predictor ($p=0.038$) of a high grade complication.

Conclusions: Our results showed 72% of ORC had a significant complication rate that is more accurately studied with longer post-operative follow-up with acceptable mortality rate. Similar results have been reported in the literature in ORC series. Accurate reporting of complications through a standardized methodology is essential for counseling patients regarding the types and risk of complications associated with ORC of the surgery.

Table 1. General Characteristic of Population. UP-028

Characteristic	ORC (n= 263 pts) (n = %)
Age (yrs)	40.30±34.09
Gender	
Female	207 (78)
Male	58 (22)
BMI (Kg/m^2)	25.06±2.70
ASA	
I	187(71)
2	62(23)
3	14(6)
Smoking History	
Yes	102(39)
No	161(61)
Diversion Type	
Ileal conduit	237(90)
Continent	26(10)
Prior systemic chemotherapy	22 (8)
Prior pelvic RT	4(1)
EBL	580.66±531

Note: ORC= Open radical cystectomy; n=Number; % =Percentage; Yrs=years; BMI= Body mass index: Kg/m2= Kilogram/meter; RT= Radiotherapy; EBL= estimate blood loss

UP-029
Non-Cancer Related Mortality in Partial versus Radical Nephrectomy for T1a Renal Cell Carcinoma: A Propensity-Based Matched Analysis

Abdo Al'a[1,2], Sun Maxine[2], Jeldres Claudio[1,2], Abdollah Firas[2], Schmitges Jan[2], Ismail Salima[1,2], Djahangirian, Orchidee[1,2], Tian Zhe[2], Liberman Daniel[1,2], Morgan Monica[1,2], Widmer Hugues[1], Shariat Shahrokh[3], Perrotte Paul[1], Karakiewicz Pierre I[1,2], Bhojani Naeem[1], Zorn Kevin[1]
[1]Department of Urology, University of Montreal Health Center, Montreal, QC, Canada; [2]Prognostics and Health Outcomes Unit, University of Montreal Health Center, Cancer, Montreal, QC, Canada; [3]Department of Urology, Weill Medical College of Cornell University, New York, NY, USA

Introduction and Objectives: Partial nephrectomy (PN) for treatment of small renal tumors is associated with a non-cancer related mortality survival advantage relative to radical nephrectomy (RN). We sought to assess and compare non-cancer related mortality rates of patients undergoing PN relative to RN.

Methods: From the Surveillance, Epidemiology and End Results database, 19656 T1aN0M0 renal cell carcinoma patients were assessable. For proper comparison of treatment modalities, propensity-based matching was performed where respectively 5935 and 13721 PN and RN patients were matched. Cumulative incidence plots and competing-risks regression analyses were generated for evaluation of non-cancer related mortality.

Results: In the propensity-based matched analysis, non-cancer related mortality rates at 5 and 10 years of follow-up for

PN versus RN were respectively 18.6 and 23.3% vs 34.3 vs 47.6% (p<0.001). Multivariable competing-risks regression analyses revealed that PN patients were respectively 80% less likely to succumb to non-cancer related mortality relative to patients treated with RN (p<0.001).

Conclusions: PN-treated T1a patients have a survival non-cancer related mortality advantage over RN-treated patients, even after propensity-based adjustment. Consequently, PN should be considered whenever surgically feasible.

UP-030

Partial Nephrectomy Versus Radical Nephrectomy for Non-Metastatic Renal Cell Carcinoma: Utilization Trends in the United States

Abdo Al'a[1,2], Sun Maxine[2], Jeldres Claudio[1], Abdollah Firas[2], Liberman Daniel[2], Schmitges Jan[2], Djahangirian Orchidée[2], Morgan Monica[1,2], Ismail Salima[1,2], Zorn Kevin[1], Shariat Shahrokh F[3], Perrotte Paul[1], Karakiewicz Pierre I[2]

[1]University of Montreal Health Center, Department of Urology, Montreal, QC, Canada; [2]University of Montreal Health Center, Cancer Prognostics and Health Outcomes Unit, Montreal, QC, Canada; [3]Weill Medical College of Cornell University, Department of Urology, New York, NY, USA

Introduction: Partial nephrectomy (PN) has several important advantages over radical nephrectomy (RN) in the management of renal cell carcinoma (RCC). The advantage hinges on the preservation of renal function and its long-term effects. Several previous investigators suggested that PN remains relatively underutilized in North America. We examined this hypothesis in a population-based analysis.

Methods: We examined the Nationwide Inpatient Sample and performed a retrospective cohort analysis of 48321 patients with non-metastatic RCC treated with PN or RN between 1998 and 2007. We examined the utilization rates of PN and RN throughout the study period, as well as the patient characteristics, in-hospital mortality, and length of stay. Finally we assessed the determinants of PN use using logistic regression models.

Results: Overall, PN was performed in 8551 patients (18%). The rate of PN increased over time: from 7% in 1998 to 26% in 2007 (p<0.001). Patients treated with PN were on average younger (mean: 60 vs 63, p<0.001) and had lower baseline Charlson Comorbidity Index [CCI] (CCI 0: 64 vs 62%, p<0.001). A higher proportion of PN patients were treated at academic (69 vs 52%, p<0.001) and high-volume (46 vs 31%, p<0.001) institutions. Laparoscopic procedure were performed less frequently in PN patients (6 vs 9%, p<0.001). The rate of in-hospital mortality (0.4 vs 0.8%, p<0.001) and the proportion of patients with a length of stay above the median (45 vs 50%, p<0.001) was lower in PN patients. After adjusting to all variables,octogenarians (odds ratio [OR]: 0.5, p<0.001), female gender (OR: 0.9, p=0.008), Hispanic race (OR: 0.8, p=0.02), CCI≥4 (OR: 0.7,p<0.001), and non-academic institutions (OR: 0.6, p<0.001) were associated with a decreased use of PN. In contrast, intermediate-(OR: 1.2, p<0.001) and high-volume institutions (OR: 1.6, p<0.001), as well as more contemporary year of surgery (2005–2007 OR:2.0, p<0.001) were associated with a higher odds of undergoing PN.

Conclusions: The rate of PN increased nearly 4-fold over the study decade, which represents a favorable result. It is of concern that important variability in PN rates exists with respect to hospital and patient characteristics. Some of these characteristics (e.g. high hospital volume, female gender, Hispanic race) could undermine access to PN and warrant closer examination within institutions where nephrectomies are performed.

UP-031

Management of T1a Renal Cell Carcinoma in the 21st Century: A Population-Based Analysis

Abdo Al'a[1,2], Sun Maxine[2], Abdollah Firas[2], Schmitges Jan[2], Bhojani Naeem[1,2], Morgan Monica[1,2], Liberman Daniel[1,2], Djahangirian Orchidée[1,2], Ismail Salima[1,2], Zorn Kevin[1], Shariat Shahrokh[3], Perrotte Paul[1], Karakiewicz Pierre I[1,2]

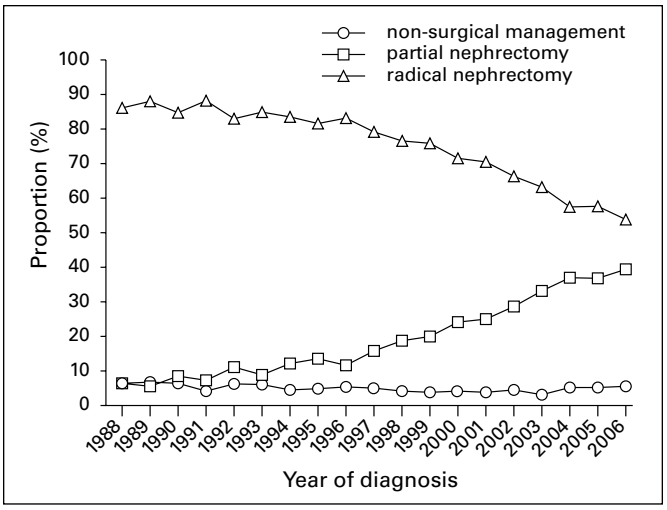

Fig. 1. UP-031

[1]University of Montreal Health Center, Department of Urology, Montreal, QC, Canada; [2]University of Montreal Health Center, Cancer Prognostics and Health Outcomes Unit, Montreal, QC, Canada; [3]Weill Medical College of Cornell University, Department of Urology, New York, NY, USA

Introduction and Objectives: Partial (PN) or radical nephrectomy (RN) represent the standard of care for patients with small renal masses. Active surveillance (AS) may also be considered. We examined the rates of PN, RN and AS within a contemporary population-based cohort.

Methods: Using the Surveillance, Epidemiology and End Results database, we identified 20663 patients diagnosed withT1aN0M0 renal cell carcinoma, between years 1988 and 2006. Determinants of PN and AS were assessed using logistic regression analyses within surgically managed patients and within the entire cohort, respectively.

Results: Overall, 5935 (29%), 13721 (66%) and 1007 (5%) patients underwent PN, RN and AS, respectively. The rate of PN increased over time: 6.7% in 1988 to 39.6% in 2006 (p<0.001, Figure 1). The rate of RN declined over time: 86.1% in 1988 to54.7% in 2006 (p<0.001). The rate of AS remained stable over time: 7.2% in 1988 to 5.7% in 2006 (p=0.6). In multivariable analyses, the determinants for PN consisted of more contemporary year of diagnosis, younger patient age, male gender, Caucasian race, and decreasing tumor size (all p<0.001). The determinants of AS consisted of more historical year of diagnosis, more advanced age, female gender, black race, decreasing tumor size, unmarried marital status, and low socioeconomic status (p<0.001 for all).

Conclusions: PN was still underutilized in the most contemporary year of the study. The low rates of AS were expected as per recent guideline recommendations. Several socio-demographic factors that are unrelated to tumor characteristics determined the type of treatment.

UP-032

Partial Nephrectomy for Tumors over 4 cms: Clinical Outcomes and Assesment of Complication Using a Graded Score

Barroso Juan, Al-Zahrani Ali, Autrán Gómez Ana Maria, Chen Lü, Williams Andrew, Chin Curtis, Park Hanuel, Luke Patrick, Izawa Jonathan, Chin Joseph

Division of Urology, Department of Surgery, London Health Sciences Centre, University of Western Ontario, London, ON, Canada

Introduction: The role of nephron-sparing surgery (NSS) is well established for T1a renal lesions (<4 cm). Renal tumor control achieved by NSS is equivalent to one achieved by Radical Nephrectomy (RN) in appropriately selected patients, offering the benefits of decreased renal insufficiency rate when compared to RN. Recent data for renal tumors > 4 cms have suggested that it might be possible to expand the indication of NSS, with comparable oncological and clinical outcomes. However,

NSS for tumors >4 cm has been associated with a slightly higher rate of complications.
Objectives: To evaluate the oncological and clinical outcomes of NSS for renal tumor > 4 cms and to assess the complications based in a graded, validated and reproducible score (Clavien score).
Material and Methods: After the approval of the institutional ethics board, we retrospectively identified 214 patients who underwent NSS for renal tumors. Thirty nine patients had tumors over 4 cm. The study period was from 2002 to 2009. Patients with metastasis at the time of diagnosis, follow-up less than 6 months or with non sporadic tumors were excluded from the study. Continues and categorical variable were assessed with Mann-Whitney U test and chi-square test, respectively. Kaplan-Meier analysis was used to calculate the overall survival and cancer specific survival rate. The assessment of the complications was done using the Clavien score.
Results: 45 tumors were identified in 39 patients. The median age was 61 year ± 1.7. Median tumor size was 5.2 cm. The surgical indication was imperative in 7 patients (solitary kidney or contralateral atrophic kidney) and elective in 32 (82%). The final pathology report showed that 34 (81.2%) and 5 (18.2%) tumors were malignant and benign, respectively. After a mean follow- up of 35.8 months (median 34 months), the over all survival rate was 89.7% while none had died from renal tumors. Tumor recurrence was detected in 2 patients (5.9%). There were 18 complications in 14 patients (35.9%) and most of these complications were grade 1-2 (61.1%).
Conclusion: NSS for tumors >4 cm is surgically feasible and has good oncological outcome. Assessment of the peri-operative complications with the Clavien grading system showed that most of these events are minor in severity (Grade 1-2).

UP-033

Radical Nephrectomy in Patients with Inferior Vena Cava and Renal Vein Involvement: Oncological, Clinical Outcomes and Assesmentof Complications Using a Graded Score

Barroso Juan, Al-Zahrani Ali, Autrán Gómez Ana Maria, Chen Lü, Williams Andrew, Chin Curtis, Park Hanuel, Izawa Jonathan, Chin Joseph
Division of Urology, Department of Surgery, London Health Sciences Centre, University of Western Ontario, London, ON, Canada
Introduction: Renal cell carcinoma (RCC) represents 3-4% of all solid cancer and it has special propensity for invasion of the venous system. RCC invades the inferior cava vein (IVC) in 4 to 10% of the patients. The cornerstone of treatment is aggressive surgical management. The reported 5 year and 10 year overall survival rates are 60% and 20%, respectively. There are few reports addressing the complication rats after the surgical intervention in this group of patients.
Objectives: The objective of this study is to report the survival and the complication rates of RCC patients with venous involvement. The perioperative complications assessment was based on the Clavien scoring system.
Material and Methods: This is a retrospective single center review of patients underwent radical nephrectomy for RCC with venous involvement between 2000 and 2010. The institution ethic committee had approved the study. Patients with metastasis at the time of diagnosis or follow-up less than 6 months were excluded from the study. The complications were assessed using the Clavien scoring system. Mann-Whitney U test and chi-square test were used for continues and categorical variables, respectively. Survival analyses were calculated with Kaplan-Meier method.
Results: Twenty-three patients had been identified in our records. The median age of these patients are 68 year (±9.72) and the median follow-up was 16.6 months (95% CI: 16.27-39.83). Most of the patients had symptomatic presentation (87%). There were 21 reported complications in 15 patients (65.2%). Most of these complications (80%) were minor (Clavien I-II). There was no intraoperative or postoperative mortality. Nine patients developed metastasis during follow-up (39.1%) and in four of them the metastases were in 2 or more organs. One patient had local recurrence in the renal bed (4.3%). The disease specific survival and overall survival rats are 69.5% and 65.2% respectively.
Conclusion: Most of RCC patients with venous system involvement are symptomatic. Approximately one fifth of these patients develop major complication (Clavien III-IV) postoperatively with very low mortality rate.

UP-034

The Tip-of-12th Rib Flank Incision for Nephron-Sparing Renal Tumor Resection

Andreoiu Matei, Muruve Nicolas
Department of Urology, Cleveland Clinic Florida, Weston, FL, USA
Introduction and Objective: The most commonly used techniques for performing open nephron-sparing surgery for renal tumors utilize the supra-11th rib or subcostal flank incisions. An incision from the tip of the 12th rib has traditionally been viewed as not offering optimal access to the kidney, particularly when attempting resection of upper pole or left renal tumors. Based on our experience, we have found this approach to be safe and effective for all tumors amenable to nephron-sparing surgery. We review our experience with the tip-of-12th rib flank incision approach in performing open partial nephrectomy.
Methods: 51 consecutive cases of open partial nephrectomy were performed from January 2009 to December 2010 using an incision from the tip of the 12th rib carried medially to the lateral border of the rectus muscle. This approach did not involve any rib resection and allowed for retroperitoneal dissection and kidney mobilization. All surgeries were performed by one surgeon experienced in this approach. The cases were retrospectively reviewed and defining characteristics of the masses and surgical outcomes were examined and recorded.
Results: The average patient age was 64 years. There were 30 left-sided tumors resected vs 21 right-sided. 21 patients had upper pole tumors, while 15 each had mid-zone and lower pole tumors. 24 tumors were located medially vs 15 laterally. The average clamp time was 27.2 min and the average blood loss was 226.5 mL per case. Final pathologic tumor size averaged 3.5 cm. 17 of the tumors resected measured more than 4 cm in size. There were no intra-operative complications and only 5 patients experienced surgical site complications in the form of minor hematomas or urinomas.
Conclusions: On the basis of our experience, the tip-of-12th rib flank incision has proven to be a reliable and efficacious approach in performing open partial nephrectomy. Further, it can be used to resect any renal masses considered suitable for nephron-sparing surgery regardless of size, location or laterality. This approach offers excellent operative parameters while allowing an extra-peritoneal approach and largely eliminating the risk of pleural injury. A more widespread use of this technique can be advocated.

UP-035

Open vs Robot-Assisted Laparoscopic Nephron-Sparing Surgery: Are the Tumor-Free Margins Equivalent?

Andreoiu Matei, Muruve Nicolas
Department of Urology, Cleveland Clinic Florida, Weston, FL, USA
Introduction and Objective: Robot-assisted laparoscopic surgery is becoming an increasingly prevalent technique for renal tumor resection due to its minimally-invasive nature. Attention has been directed toward determining the ability of this technique to achieve oncologic control equivalent to open surgery. One of the concerns raised is whether the magnified intra-operative visualisation offered by the robot-assisted laparoscopic approach will lead to overestimation of the distance between tumor edge and line of resection and result in narrower tumor-free margins in laparoscopic cases compared to those obtained throught the traditional open surgical approach. Our objective was to examine whether robot-assisted laparoscopic nephron-sparing surgery impacts a surgeon's ability to assess margin depth leading to inferior tumor-free margins on final pathology.
Methods: A retrospective comparison review of 51 consecutive open vs 31 robotic-assisted laparoscopic nephron-sparing renal tumor resection cases over the past 2 years (January 2009 to December 2010) was undertaken. The defining clinical and pathologic characteristics of each

tumor were recorded and the pathology report from each case examined for the specified distance between the tumor and resection margins. A Student's t-test was used to assess for a significant difference between the average tumor-free margin distance of the two groups (Figure 1).
Results: Clinical and pathologic tumor characteristics were equivalent between the two groups. There were no intraoperative complications in either group. No robotic cases had to be converted to the open approach. There was no significant difference in the average tumor-free margin distance of the two groups, with average distances of 2.89 mm and 2.73 mm in the open surgical and robotic-assisted cases, respectively.
Conclusions: The operative field magnification available with robot-assisted laparocopic partial nephrectomy does not appear to impair the surgeon's ability to assess proper margin depth during renal tumor resection. This suggests that both techniques result in equivalent local oncologic control post-operatively.

UP-036

Anticancer Effects of Toll-Like Receptor-3 Agonist in Bladder Cancer

Ayari Cherifa, Bergeron Alain, LaRue Helene, Fradet Yves
Laval University Cancer Research Centre, CHUQ-L'HDQ, Quebec, QC, Canada

Introduction and Objective: Toll-like receptors (TLR) play a major role in the innate immune response. They are expressed by immune cells but also by some epithelial cells. To evaluate the role of TLR3 in the innate immune response of urothelial cells (UCs), we analyzed its expression and functionality in these cells.
Methods: Immunohistochemistry was used to detect TLR3 expression in 11 normal urothelia and 26 bladder tumors. TLR3 mRNA expression was analyzed in primary cultures of normal UCs and in 15 bladder cancer cell lines by RT-PCR. The functionality of TLR3 signaling was analyzed in bladder cancer cell lines after treatment with the TLR3 agonist Poly(I:C), or with BCG as a point of comparison. Secretion of pro-inflammatory cytokines was assessed using ELISA. MAP-kinase phosphorylation was analyzed by Western blotting, and NF-βB localization was assessed by confocal microscopy. Effect of TLR3 agonist treatment on cell growth was measured by fluorocytometry.
Results: Expression of most TLR3 mRNAs was detected in primary cultures of normal UCs and in bladder cancer cell lines. TLR3 protein is expressed in normal urothelia and its expression was generally maintained in non-muscle-invasive tumors, although slightly weaker, but markedly decreased in muscle-invasive tumors. Poly(I:C), an agonist of TLR3, produced a strong pro-inflammatory response in MGH-U3 bladder cancer cells as it induced secretion of IL8, IL6 and IL1-ß. Treatment of MGH-U3 cells with Poly(I:C) led to nuclear translocation of NF-βB and induction of phosphorylated JNK MAP-kinase, confirming the functionality of this TLR in UCs. We then tested the effect of Poly(I:C) and BCG, as a comparison, on the growth of MGH-U3 cells. Poly(I:C) but not BCG induced growth arrest in G1-S phase and apoptosis. The effect on cell proliferation and apoptosis was increased in a dose dependent manner upon combination of BCG with Poly (I:C) treatments.
Conclusion: TLR3 is expressed in normal urothelium. Its expression is slightly weaker in non-muscle invasive cancer but much decreased in muscle-invasive cancer. TLR3 activation promotes a strong inflammatory response as well as pro-apoptotic and anti-proliferative effects. This study suggests that Poly(I:C), due to its direct anti-neoplasic effects might be a new therapeutic agent for the treatment of bladder cancer.
Research supported by a grant from the CIHR.

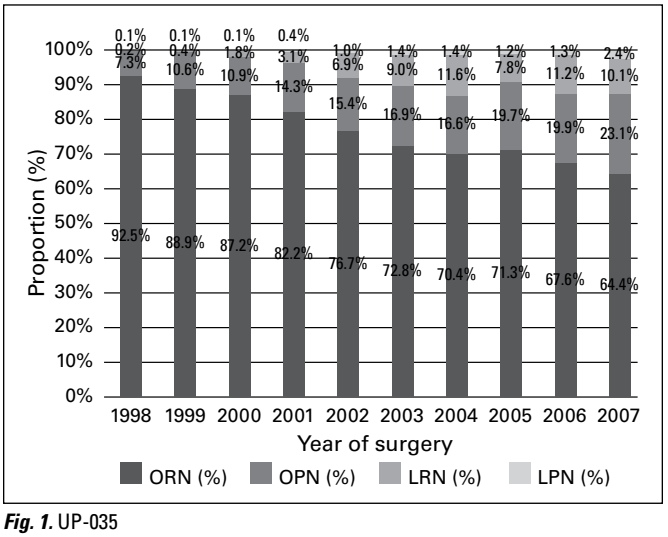

Fig. 1. UP-035

UP-037

Marital Status as a Gender-Related Risk Factor for Advanced Stage at Radical Cystectomy and Less Favorable Survival

Djahangirian Orchidée[1,2], Morgan Monica[1,2], Sun Maxine[2], Schmitges Jan[2,3], Abdollah Firas[2,4], Tian Zhe[2], Shariat Shahrokh[5], Perrotte Paul[1], Karakiewicz Pierre[1,2]
[1] Department of Urology, University of Montreal Health Center, Montreal, QC, Canada; [2] Cancer Prognostics and Health Outcomes Unit, University of Montreal Health Center, Montreal, QC, Canada; [3]Martini-Klinic, University Medical Center Hamburg-Eppendorf, Hamburg, Germany; [4]Department of Urology, Vita Salute San Raffaele University, Milan, Italy; [5]Department of Urology, Weill Medical College of Cornell University, New York, NY, USA

Introduction: Marital status (MS) has been shown to affect the natural history of many malignancies. We examined the effect of MS on the rate of non-organ confined disease (NOCD) at cystectomy, as well as on the rate of cancer-specific mortality (CSM) and all-cause mortality (ACM) after radical cystectomy (RC) for urothelial carcinoma of the urinary bladder (UCUB).
Methods: Within the Surveillence, Epidemiology, and End Results (SEER) database, we identified 7162 patients who underwent RC for UCUB of all stages between 1988 and 2001. Univariable and multivariable logistic regression analyses focused on the rate of NOCD (T3-4/NI+/M0) at RC. Univariable and multivariable Cox regression models addressed CSM and ACM. All analyses were then stratified according to gender. Covariates consisted of socioeconomic status, tumor stage, age, race, tumor grade, year of surgery.
Results: Never married (NM) males had a higher rate of NOCD at RC (OR: 1.37, p=0.002). No effect according to MS was found in females. Separated/divorced/widowed (SDW) females had a higher rate of CSM than married females (HR: 1.17, p=0.05). SDW and NM males had higher rates of ACM than their married counterparts (HR: 1.19, p<0.001 and HR: 1.33, p<0.001, respectively). Similarly, SDW and NM females also had higher rates of ACM than married females (HR: 1.26, p<0.001 and HR: 1.26, p=0.03, respectively).
Conclusions: Less favourable stage is more commonly seen in NM males. Higher rate of CSM is more frequent in SDW females. Finally, NM or SDW status confers a higher risk of ACM in both genders.

UP-038

Rates of Continent Urinary Diversion after Radical Cystectomy: Is There a Place for Improvement?

Jeldres Claudio, Sun Maxine, Johal Rupi, Ismail Salima, Abdo Al'a, Liberman Daniel, Perrotte Paul, Karakiewicz Pierre I
Department of Urology, University of Montreal, Montreal, QC, Canada

Introduction: The National Comprehensive Cancer Network guidelines state that benefits of continent urinary diversion (CUD) consist of bladder function that is similar to that of a native bladder. In consequence, CUD should be performed in all patients in whom such reconstructive procedure can be safely performed. Increasing familiarity with this type of

procedure overtime should lead to an increase in its use. We tested this hypothesis in a large North American population-based cohort.
Methods: Between 1998 and 2007, 12274 patients treated with radical cystectomy within the Nationwide Inpatient Sample were identified. Patients with unknown urinary diversion type were excluded from further analyses (n=676). CUD rates were stratified according year of surgery. Multivariable logistic regression analyses tested the independent predictor status of year of surgery, as a determinant of CUD. Other covariates consisted of age, comorbidity, race, gender, annual hospital volume and hospital type.
Results: CUD rates ranged from 3.8% in 1998 to 7.3% in 2007 ($p<0.001$). After restricting the population to teaching-centers only, CUD rates ranged from 5.7 to 8.8% for the same period ($p=0.008$). Similarly, after restriction to hospitals with high annual volume (upper tertile), CUD rates ranged from 7.9 to 10.2%. ($p=0.1$). In multivariable analyses, year of surgery was an independent predictor of CUD rate. Patients operated in 2000-2001, 2002-2003, 2004-2005, 2006-2007 periods had respectively a 1.2, 1.5, 1.3, and 1.4-fold higher probability of undergoing a CUD relative to patients operated between 1998-1999 period ($p=0.02$).
Conclusions: The CUD rate increased over the study period. However, it remained extremely low even at teaching-centers and at high volume hospitals. These results imply that the vast majority of cystectomy patients remain deprived from the possible benefits of CUD.

UP-039

The Rate of Transfusions, Complications, Length of Stay, and In-Hospital Mortality in Patients Treated with Cytoreductive Nephrectomy for Metastatic Renal Cell Carcinoma Patients

Jeldres Claudio, Abdo Al'a, Morgan Monica, Sun Maxine, Liberman Daniel, Johal Rupinder, Ismail Salima, Perrotte Paul, Karakiewicz Pierre I
Department of Urology, University of Montreal, Montreal, QC, Canada
Introduction and Objectives: There is paucity of post-operative data for patients undergoing cytoreductive nephrectomy (CNT) for metastatic renal cell carcinoma (mRCC). We sought to examine post-operative characteristics of CNT in a large contemporary retrospective cohort originating from the United States.
Methods: We relied on the Nationwide Inpatient Sample and identified 3300 patients treated with CNT for mRCC, between years 1998 and 2007. Post-operative complications were defined according to previous methodology [10.1016/j.juro.2007.01.037]. Univariable and multivariable logistic regression analyses assessed the rate of (1) transfusions, (2) complications, (3) length of stay, and (4) in-hospital mortality in the entire cohort. Covariates consisted of patient age, race, gender, year of admission quartiles, Charlson comorbidity index (CCI), number of metastatic sites, hospital type, hospital volume, and extent of nephrectomy (partial vs radical).
Results: Median age was 65 years (interquartile range: 55–75). CCI was 0, 1, 2 and + or = 3 in respectively 66, 23, 5 and 6% of patients. White race (61%) and male gender (67%) predominated. Overall, 1000 complications were recorded and 778 patients had at least one complication (24%). The most commonly reported complications were digestive (6.1%), accidental puncture or laceration (5.9%), hemorrhage/hematomas (4.2%), and pneumothorax (3.1%). Blood transfusions were given to 23% of patients, and 34% of patients had a length of stay above the median (+ or = 8 days). In-hospital mortality was 2.4% after CNT. In multivariable analyses, CCI + or = 3 (odds ratio [OR]: 1.5, $p=0.03$), female (OR: 1.3, $p=0.01$), and more contemporary years (2006–2007 OR: 1.9, $p<0.001$) were significantly associated with an increased rate of transfusion. Only non-academic centers (OR: 1.2, $p=0.048$) were associated with an increased rate of complications. Patients aged >75 years (OR: 1.9, $p<0.001$), CCI + or = 3 (OR: 2.7, $p<0.001$), and of black race (OR: 2.3, $p<0.001$) portended to a longer length of stay. Finally, patients aged >75 years were more likely to succumb to in-hospital mortality (OR: 2.9, $p<0.001$) following CNT.
Conclusion: Results from a large contemporary population-based data show that post operative outcomes associated with CNT are acceptable. Current data demonstrate that restriction of this procedure to highly select patients still holds.

UP-040

Open Radical Prostatectomy Performed by Low Volume Surgeons Predisposes to Higher Rates of Rectal Laceration

Jeldres Claudio, Sun Maxine, Johal Rupinder, Ismail Salima, Abdo Al'a, Djahangirian Orchidée, Morgan Monica, Liberman Daniel, Perrotte Paul, Karakiewicz Pierre I
Department of Urology, University of Montreal, Montreal, QC, Canada
Introduction: Rectal laceration (RL) represents a highly unfavourable outcome at open radical prostatectomy (ORP) and may lead to rectourethral fistula formation and total urinary incontinence. The latest and most contemporary report (n=4592) estimated the rate of RL at 0.7% and originates from a single center of excellence. We examined the most contemporary RL rates and temporal trends in a large population-based cohort.
Material and Methods: Between 1999 and 2008, 34653 ORPs were performed in the state of Florida. Rates and trends of RL were assessed. Univariable and multivariable logistic regression analyses focused on prediction of RL. Predictors included age, race, surgical volume tertiles (SV), and baseline Charlson Comorbidity Index (CCI).
Results: The overall RL rate was 0.7%. The rate of RL remained stable over the study period (0.8-0.5%, $p=0.8$). RL was indirectly related to SV: RL rate was 1.0% at ORP performed within the low SV tertile vs 0.7 and 0.5% in respectively the intermediate and high SV tertile ($p<0.001$). Of all RL, 54.1% were caused by low volume surgeons. RL rate was lower in white race than in other race (0.6 vs 1.0%, $p<0.001$). After adjusting for all covariates, patients operated by low and intermediate SV surgeons were respectively at 2.2 and 1.5 fold higher risk of RL than patients operated by high SV surgeons ($p<0.001$ and $p=0.03$). The risk of RL also remained higher for other than white race (OR: 1.7; $p<0.001$). Age and CCI failed to reach statistical significance.
Conclusions: RL rates were strongly related to SV. Patients operated by low SV surgeons are at a significantly higher risk of RL. This finding has important implications for informed consent.

UP-041

Complications of the Laparoscopic vs the Open Techniques in Patients with Non-Metastatic Renal Cell Carcinoma (RCC) Treated with Partial or Radical Nephrectomy: A Population-Based Analysis of the United States

Jeldres Claudio, Sun Maxine, Liberman Daniel, Perrotte Paul, Karakiewicz Pierre I
Department of Urology, Université de Montréal, Montreal, QC, Canada
Introduction and Objectives: The advent of laparoscopic procedure has challenged the use of open approach for partial nephrectomy (PN) and radical nephrectomy (RN) in RCC. We sought to compare complications between open RN (ORN) vs laparoscopic RN (LRN) and open PN (OPN) vs laparoscopic PN (LPN), using a large population-based retrospective cohort.
Material and Methods: We examined the Nationwide Inpatient Sample and identified 39770 and 8551 patients with non-metastatic RCC treated with RN or PN, between years 1998 and 2007, respectively. The type of complication was defined according to previously published methodology (doi: 10.1016/j.juro.2007.01.037). Separate univariable and multivariable models were fitted to examine the rate of having any postoperative complication, according to RN and PN patients. Tested predictors consisted of laparoscopic procedure, age, gender, race, Charlson comorbidity index (CCI), hospital type, hospital volume, length of stay and year of surgery.
Results: ORN and LRN was 91 and 9%, respectively vs 94 vs 6% for OPN and LPN. In RN patients, age ($p=0.049$) and baseline CCI ($p<0.001$) was statistically significantly different between the open vs laparoscopic approach. Conversely, no differences in age and CCI were detected between OPN and LPN. The rate of any complications was 16% in RN and 15% in PN. Respectively 17 and 12% of ORN and LRN patients ($p<0.001$) had a complication vs 15 and 11% of OPN and LPN patients ($p=0.01$), respectively. The most commonly reported types of complications for RN were hemorrhage/hematoma (31%), digestive (31%), respiratory (23%), and cardiac (9%). For PN, it was digestive (31%), hemorrhage/hematoma (28%), respiratory (26%), and cardiac (9%). ORN was associated with a higher rate of respiratory (4.5 vs 2.3%, $p<0.001$) and

hemorrhage/hematoma (6.0 vs 3.7%, $p<0.001$) complications relative to LRN. In contrast, OPN and LPN patients had a similar rate of complication types. In multivariable analyses, LRN had a lesser rate of complications than ORN patients (odds ratio: 0.80, $p=0.03$), while no statistically significant difference was observed between LPN and OPN patients (odds ratio: 0.90, $p=0.4$).

Conclusions: Complication rates between LPN and OPN were comparable. In contrast, LRN was associated with fewer complications than ORN. This finding should be interpreted in the light that over 90% of RN is being performed in the open fashion.

UP-042

Development and Internal Validation of a Highly Accurate Preoperative Nomogram for Prediction of Cancer-Specific Mortality for Squamous Cell Carcinoma of The Penis

Jeldres Claudio, Sun Maxine, Abdo Al'a, Johal Rupinder, Liberman Daniel, Ismail Salima, Morgan Monica, Perrotte Paul, Karakiewicz Pierre I
Department of Urology, University of Montreal, Montreal, QC, Canada

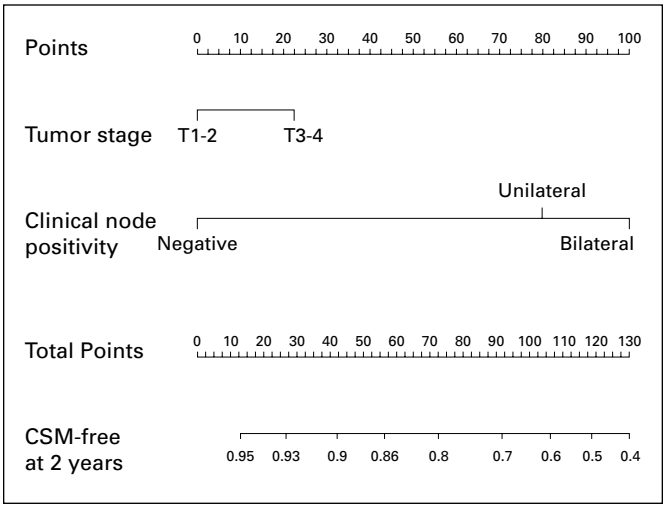

Fig. 1. UP-042

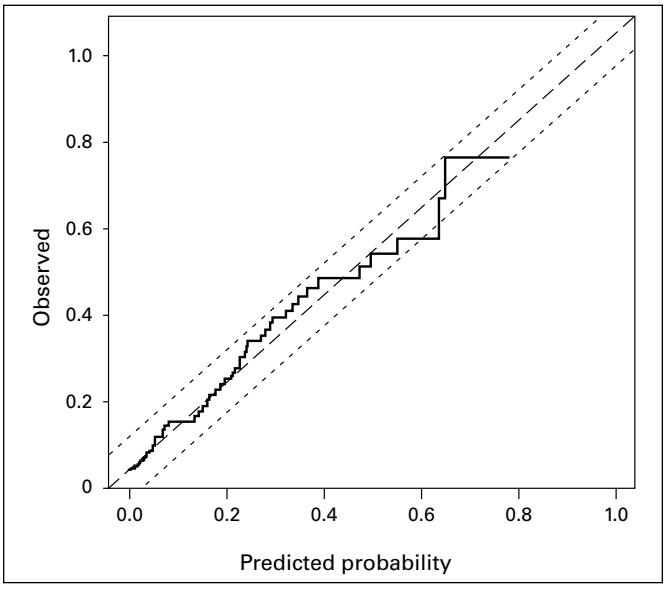

Fig. 2. UP-042

Introduction and Objectives: Patients with squamous cell carcinoma (SCCP) represent a heterogeneous group. Currently, no model using preoperative characteristics exists for prediction of prognosis in these patients. To address this limitation, we developed a nomogram predicting cancer-specific mortality (CSM) using routinely available preoperative characteristics.

Methods: Three-hundred-twenty-three consecutive patients with SCCP were treated with a sentinel node biopsy and/or ILND at a single institution, between years 1988 and 2008. Multivariable Cox regression model for prediction of CSM was fitted. The examined predictors included age (continuously coded), tumor stage (T1, T2, T3–4), and clinical node positivity (negative, unilateral, bilateral). Backward variable selection was applied to identify the most informative and parsimonious model. The model discrimination was quantified using Harrell's concordance index. Calibration plot explored the relationship between predicted and observed estimates.

Results: Average age was 65 years (median 66). Tumor stage distribution was 26.6, 50.2, and 23.2% for respectively T1, T2 and T3–4 SCCP. Clinical node positivity was negative in 75%, unilateral in 18%, and bilateral in 7%. The two-year CSM-free survival rates were 85.2% (95% CI: 81.4 – 89.2%). Patients with T3–4 were more likely to die of CSM (hazard ratio [HR]: 2.2, $p=0.046$). Unilateral or bilateral clinical node positivity portended to an 8- and 14-fold higher rate of CSM (both $p<0.001$). Model discrimination for CSM-free survival was 85% accurate at 2 years (Figure 1). Calibration was good between predicted and observed probabilities (Figure 2).

Conclusions: This represents the first preoperative model for prediction of CSM in patients treated with an ILND for SCCP. In the absence of other tools with prognostic ability using preoperative variables, the current tool may be considered useful for clinicians during counselling. Its external validation is awaited.

UP-043

Metastatic Renal Cancer in the Targeted Therapy Era: The Sherbrooke Experience

Jundi Mazen[1], Bettez Mathieu[1], Richard Patrick[1], Abatzoglou Anastassia[1], Mija Florin[1], Girard Nancy[1], Ramsay Sophie[1], Carmel Michel[1], Asselah Jamil[2], Sabbagh Robert[1]
[1]Department of Surgery, Division of Urology, Sherbrooke University, Sherbrooke, QC, Canada; [2]Department of Medicine, Sherbrooke University, Sherbrooke, QC, Canada

Introduction and Objective: In the past 5 years, the introduction of targeted therapy has dramatically changed the outcome of patients with metastatic renal cell cancer (mRCC). In particular, drugs that inhibit

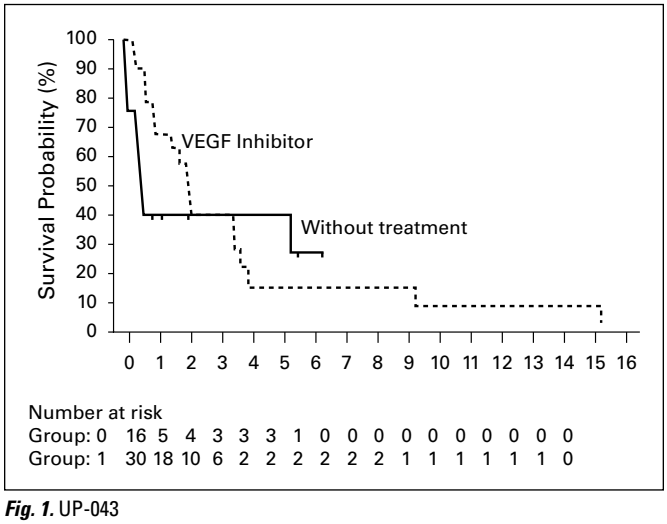

Fig. 1. UP-043

signaling of vascular endothelial growth factor (VEGF) and mammalian target of rapamycin (mTOR) have significantly improved the perspectives of patients. The aim of this study is to compare the survival of our population to the literature pertaining patients with mRCC with or without VEGF inhibitors.

Methods: We retrospectively reviewed the charts of 46 mRCC patients treated at our center from January 2004 to November 2010. We estimated the overall survival rate using Kaplan-Meier curves.

Results: Of the forty-six patients, 30 patients received VEGF inhibitors. Patients were stratified according to the Memorial Sloan Kettering Cancer Center predictors of short survival. Seven, 15 and 6 patients had good, intermediate and poor prognosis, respectively with a median overall survival rate of 3.5, 1.8 and 2.1 years, respectively. There were no statistically significant difference (p=0.3494) in overall survival rate between patients on VEGF inhibitors and those on conservative treatment regardless of the prognosis stratification (Figure 1).

Conclusion: We found no significant differences in overall survival rate between patients taking or not VEGF inhibitors probably due to the small number of patients. Compared to the literature, this study has a similar median survival rate.

UP-044

Risk Factors for Bladder Cancer Recurrence After Nephroureterectomies for Upper Tract TCC

Lacombe Louis[1], Kassouf Wassim[2], Rendon Ricardo[3], Jacobsen Niels[4], Fairey Adrian[4], Izawa Jonathan[5], Kapoor Anil[6], Black Peter[7], Tanguay Simon[2], Chin Joe[5], So Alan[7], Lattouf Jean-Baptiste[8], Bell David[3], Saad Fred[8], Matsumoto, Edward D.[6], Drachenberg Darrel[9], Cagiannos Ilias[10], Fradet Yves[1]

[1]Division of Urology, Department of Surgery, Laval University, Quebec, QC, Canada; [2]Division of Urology, Department of Surgery, McGill University, Montreal, QC, Canada; [3]Division of Urology, Department of Surgery, Dalhousie University, Halifax, NS, Canada; [4]Division of Urology, Department of Surgery, University of Alberta, Edmonton, AB, Canada; [5]Division of Urology, Department of Surgery, University of Western Ontario, London, ON, Canada; [6]Division of Urology, Department of Surgery, McMaster University, Hamilton, ON, Canada; [7]Department of Urology, University of British Columbia, Vancouver, BC, Canada; [8]Division of Urology, Department of Surgery, University of Montreal, Montreal, QC, Canada; [9]Division of Urology, Department of Surgery, University of Manitoba, Winnipeg, MB, Canada; [10]Division of Urology, Department of Surgery, University of Ottawa, Ottawa, ON, Canada

Introduction and Objectives: Carcinomas of the upper urinary tract (UUT) are uncommon and few prognostic factors have been identified to determine the risk of bladder cancer recurrences after nephroureterectomies. We report these risk factors from cohorts of patients from 10 Canadian University Centers.

Methods: We reviewed all UUT tumors treated at 10 University Centers over the past 2 decades. Of 1029, 742 patients had the necessary information and formed the basis of this report: 420 had renal pelvic tumors, 161 had ureteral tumors, and 141 had both renal pelvic and ureteral tumors. Covariables at time of nephroureterectomies included: age, gender, smoking status, presence of hydronephrosis, symptoms at presentation, pT and pN stage, grade, presence of CIS, tumor localization, multifocality, previ-

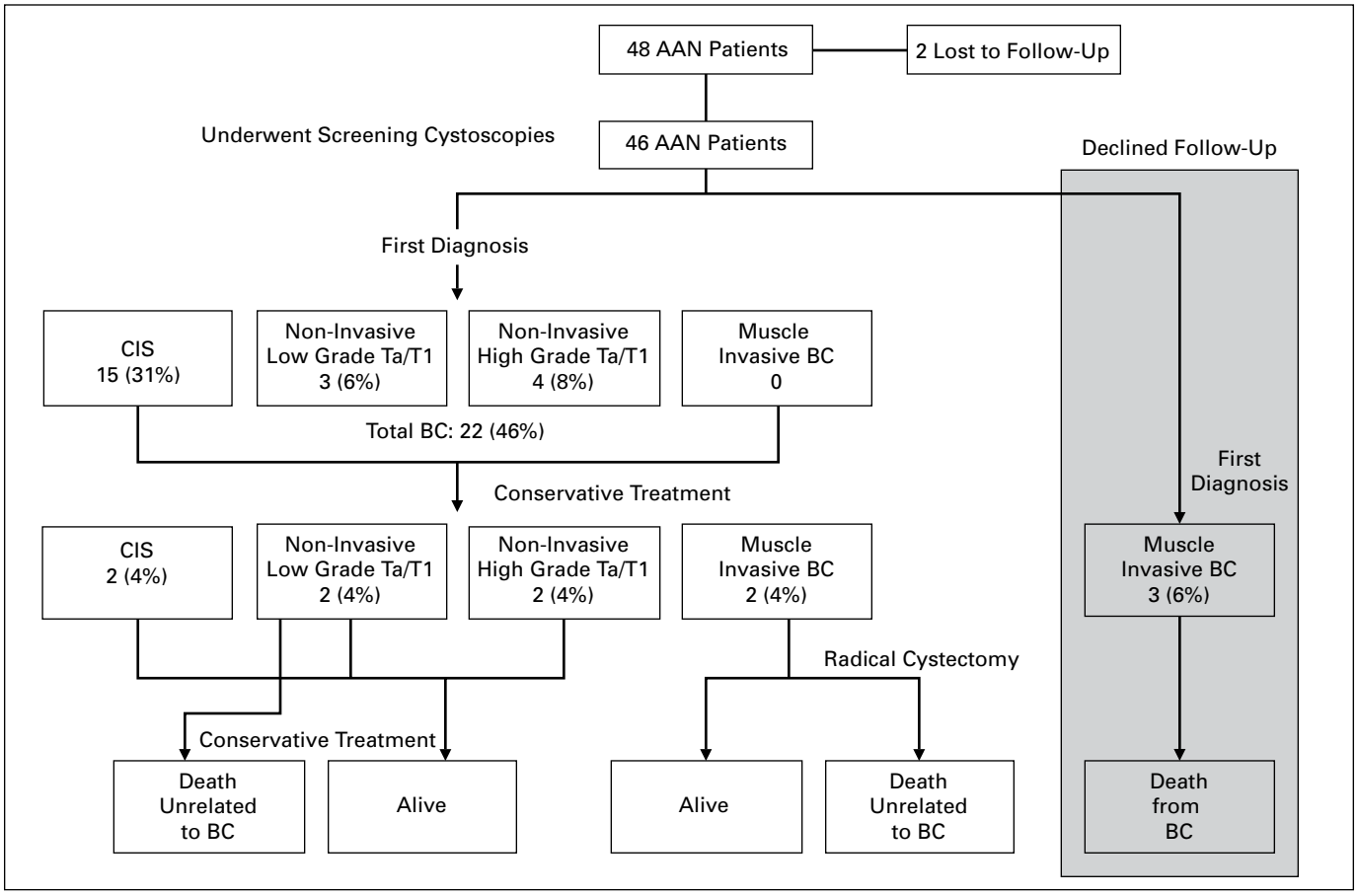

Fig. 1. UP-045

ous upper tract TCC, tissue architecture, previous abdominal XRT, distal ureter management, surgical margins and use of adjuvant chemotherapy.
Results: Mean age was 69.7 years, 41% of the patients were women and interval between nephroureterectomies and bladder cancer recurrence was 2.8 years.
Conclusions: Based on this retrospective analysis of 742 cases, older age, multifocal tumors involving both renal pelvis and ureter and use of adjuvant chemotherapy are risk factors for bladder cancer recurrences.

UP-045

The Importance of Pelvic Lymph Node Dissection in the Elderly: Implications for Interpretation of the 2010 National Comprehensive Cancer Network Practice Guidelines for Bladder Cancer Treatment

Liberman Daniel[1], Jeldres Claudio[1], Ismail Salima[1], Morgan Monica[1], Widmer Hugues[1], Zorn Kevin[1], Shariat Shahrokh F[2], Perrotte Paul[1], Karakiewicz Pierre I[1,3]
[1]Department of Urology, University of Montreal Health Center, Montreal, QC, Canada; [2]Department of Urology, Weill Medical College of Cornell University, New York, NY, USA; [3]Cancer Prognostics and Health Outcomes Unit., Montreal, QC, Canada
Introduction and Objective: The 2010 National Comprehensive Cancer Network (NCCN) practice guidelines indicate that at radical cystectomy (RC), pelvic lymph node dissection (PLND) can be omitted in elderly patients. We set to examine the rate of PLND in advanced age (!80 years), as well as the impact of PLND on cancer-specific- (CSM) and overall mortality (OM) in these patients.
Methods: We examined 11183 patients treated with RC, within 17 Surveillance, Epidemiology and End Results registries. Univariable and multivariable Cox regression analyses tested the effect of PLND on CSM and OM.
Results: Overall, PLND was omitted in 25% of patients (<80 years: 24.2% vs ≥80 years: 30.8%, $p<0.001$). The 5-year CSM-free rates for PLND vs no PLND patients were 62.5 vs 59.9% in individuals aged <80 years ($p=0.01$), and 50.0 vs 46.1% in individuals aged ≥80 years ($p=0.005$). The 5-year OM-free rates for the same categories were respectively 48.8 vs 43.9% ($p<0.001$), and 28.3 vs 24.7 ($p=0.01$). In multivariable analyses, omitting PLND was associated with a 1.3-fold higher CSM rate (<80 years: 1.3- vs ≥80 years: 1.3-fold, all $p<0.001$). Similarly, omitting PLND was associated with a 1.3-fold higher OM rate (<80 years: 1.3- vs ≥80 years: 1.2-fold, all $p\leq0.005$) (Figure 1).
Conclusions: Our results indicate that PLND was more frequently omitted in patients aged ≥80 vs <80 years. However, the protective effect of PLND on CSM and OM was virtually the same in both age categories. In consequence, advanced age should not represent a limiting factor for performing a PLND at RC.

UP-046

Age and Comorbidity Represent Important Determinants of Continent Urinary Diversion (CUD) Rate in Patients Treated with Radical Cystectomy (RC).

Liberman Daniel[1], Jeldres Claudio[1], Morgan Monica[1], Ismail Salima[1], Sun Maxine[2], Zorn Kevin[1], Widmer Hugues[1], Shariat Shahrokh F [3], Perrotte Paul[1], Karakiewicz Pierre I[1,2]
[1]Department of Urology, University of Montreal Health Center, Montreal, QC, Canada; [2]Cancer Prognostics and Health Outcomes Unit, Montreal, QC, Canada; [3]Department of Urology, Weill Medical College of Cornell University, New York, NY, USA
Introduction: CCI was developed to predict one-year mortality in medical patients. Currently, its use is widespread in surgical patients, including those treated with RC for urothelial carcinoma of the bladder. However, its accuracy in these patients was never tested. To address this limitation we tested the accuracy of CCI in predicting IHM after RC.
Methods: We relied on 12274 RC records for patients treated between 1998 and 2007, within the Nationwide Inpatient Sample. IHM rates were stratified according to CCI. Univariable and multivariable logistic regression analyse tested the independent predictor status of CCI as a determinant of IHM. Predictive accuracy estimates were quantified with the area under the curve (AUC), after 200 bootstrap resamples.
Results: Average patient age was 68.5 years (median 70, range 40-95) (Table 1). CCI was 0 vs 1 vs 2 vs 3 vs ≥4 in respectively 68.1 vs 22.9 vs 4.9 vs 3.0 vs 1.1% of patients. The overall IHM rate was 2.4%, and it was 1.8 vs 3.1 vs 4.0 vs 3.8 vs 12.7% for patients with CCI of respectively 0 vs 1 vs 2 vs 3 vs ≥4 ($p<0.001$). The accuracy of CCI to predict IHM was 59.6% vs 64.9% for age vs 49.9% for gender vs 48.3% for race vs 52.8% for year of surgery vs 56.6% for annual hospital volume vs 54.3% for hospital teaching status. In multivariable analyses, CCI achieved independent predictor status of IHM. The accuracy of the final model was 68.1%.
Conclusions: Although CCI is an independent predictor of IHM after RC, its ability to identify individual IHM event is relatively poor, as it misclassifies virtually 40% of IHM events. The consideration of other variables resulted in an important improvement in the ability to predict IHM. In consequence, a RC-specific comorbidity index may be warranted.

UP-047

Accuracy Of the Charlson Comorbidity Index (CCI) in Predicting In-Hospital Mortality (IHM) in Patients Treated with Radical Cystectomy (RC)

Liberman Daniel[1], Sun Maxine[2], Jeldres Claudio[1], Abdo Al'a[1], Ismail Salima[1], Morgan Monica[1], Pharand Daniel[1], Widmer Hugues[1], Shariat Shahrokh F[3], Perrotte Paul[1], Karakiewicz Pierre I[1,2]
[1]Department of Urology, University of Montreal Health Center, Montreal, QC, Canada; [2]Cancer Prognostics and Health Outcomes Unit, Montreal, QC, Canada; [3]Department of Urology, Weill Medical College of Cornell University, New York, NY, USA

Table 1. Charlson comorbidity index (CCI). UP-046

		Overall % (95% CI) (n: overall)	CCI: 0 % (95% CI) (n: overall)	CCI: 1 % (95% CI) (n: overall)	CCI: ≥2 % (95% CI) (n: overall)
	Overall	7.0 (6.5-7.5) (812:11598)	8.2 (7.6-8.8) (646:7879)	4.6 (3.9-5.5) (124:2682)	4.1 (2.9-5.4) (42:1037)
Age (years)	**≤59**	15.1 (13.6-16.6) (330:2191)	16.1 (14.4-17.9) (275:1710)	11.9 (8.6-15.8) (40:337)	10.4 (5.9-16.6) (15:144)
	60-69	9.0 (8.1-10) (307:3400)	10.4 (9.2-11.8) (239:2291)	6.5 (4.9-8.4) (54:830)	5.0 (2.8-8.3) (14:279)
	70-79	3.6 (3.1-4.2) (162:4466)	4.3 (3.6-5.1) (123:2868)	2.4 (1.6-3.5) (28:1162)	2.5 (1.3-4.5) (11:436)
	≥80	0.8 (0.4-1.4) (13:1541)	0.9 (0.4-1.7) (9:1010)	0.6 (0.1-2) (2:353)	1.1 (0.1-4) 1.2 (2:178)

Introduction: Charlson comorbidity index (CCI) was developed to predict one-year mortality in medical patients. Currently, its use is widespread in surgical patients, including those treated with radical cystectomy (RC) for urothelial carcinoma of the bladder. However, its accuracy in these patients was never tested. To address this limitation we tested the accuracy of CCI in predicting in-hospital mortality (IHM) after RC.
Methods: We relied on 12274 RC records for patients treated between 1998 and 2007, within the Nationwide Inpatient Sample. IHM rates were stratified according to CCI. Univariable and multivariable logistic regression analysis tested the independent predictor status of CCI as a determinant of IHM. Predictive accuracy estimates were quantified with the area under the curve (AUC), after 200 bootstrap resamples.
Results: Average patient age was 68.5 years (median 70, range 40-95). CCI was 0 vs 1 vs 2 vs 3 vs ≥4 in respectively 68.1 vs 22.9 vs 4.9 vs 3.0 vs 1.1% of patients. The overall IHM rate was 2.4%, and it was 1.8 vs 3.1 vs 4.0 vs 3.8 vs 12.7% for patients with CCI of respectively 0 vs 1 vs 2 vs 3 vs ≥4 (p<0.001). The accuracy of CCI to predict IHM was 59.6% vs 64.9% for age vs 49.9% for gender vs 48.3% for race vs 52.8% for year of surgery vs 56.6% for annual hospital volume vs 54.3% for hospital teaching status. In multivariable analyses, CCI achieved independent predictor status of IHM. The accuracy of the final model was 68.1%.
Conclusions: Although CCI is an independent predictor of IHM after RC, its ability to identify individual IHM event is relatively poor, as it misclassifies virtually 40% of IHM events. The consideration of other variables resulted in an important improvement in the ability to predict IHM. In consequence, a RC-specific comorbidity index may be warranted.

UP-048

Phos-Akt as a Predictor of Tumor Recurrence Following Cystectomy for Transitional Cell Carcinoma of the Bladder

McPherson Victor[1], Williams Andrew[1], Martinez Carlos[1], Vasquez Catalina[1], Chan Susanne[2], Ong Michael[3], Chin Joseph[1], Rizkalla Kamilia[2], Izawa Jonathan[1], Lewis John[1]
[1]Department of Urology and Oncology, University of Western Ontario, London, ON, Canada; [2]Department of Pathology, University of Western Ontario, London, ON, Canada; [3]Department of Oncology, University of Western Ontario, London, ON, Canada
Introduction: Whilst advances have been made in adjuvant and neoadjuvant treatment of patients with apparently localised transitional cell carcinoma of the bladder (TCC) it remains difficult to identify those that are most likely to benefit from this treatment. Phos-Akt, a serine threonine protein kinase has been associated with poor prognosis in a variety of malignancies. We wished to evaluate the role of Phos-akt in predicting survival and recurrence following cystectomy for TCC.
Methods: 53 patients who have undergone cystectomy for cT2-cT3 high grade TCC between 2002 and 2006 (mean follow up 5.75 years) were included in this study. Tissue sections were taken from paraffin embedded slides, the paraffin was dissolved and imunohistochemical staining performed for Phos-Akt. Histological sections from corresponding levels were stained with Haemotoxyllin and Eosin and compared. Benign tissue from the same patient was used as a control. A database of patient's demographic and tumour factors, staging information and relevant survival information was generated and correlated with disease free survival.
Results: Phospho-Akt staining was positive in 48 patients and negative in 5 patients (9.5% negative rate). However the recurrence rate in the Phos-Akt positive group was 52% whilst no patients in the negative staining had recurrence of their disease. Tumour stage (<0.001) and nodal status (p.005) were strong predictors of recurrence. Both 2 year (p=0.02) and 3 year (p=0.005) disease free survival were statistically better in the Phospho-Akt negative group
Conclusions: Phos-akt appears promising as a biomarker to predict a subgroup of patients that are unlikely to develop metastatic disease following cystectomy. Although only 9.5% of patients were Phos-akt negative this has significant potential to reduce the morbidity associated with adjuvant and neoadjuvant chemotherapy. Further studies in bigger case series are required to confirm these results.

UP-049

Gonadal Vein Dissection and Delayed Orchiectomy tt Post-Chemotherapy Retroperitoneal Lymph Node Dissection; Still Bother with It?

Metcalfe Charles, Liao Lydia, Black Peter, Gleave Martin, Goldenberg Larry, So Alan
Department of Urologic Sciences, University of British Columbia, Vancouver, BC, Canada
Background: The role of performing a retroperitoneal lymph node dissection (RPLND) for node positive disease post-chemotherapy (PC) for metastatic germ cell cancer is well established. Dissection of the gonadal vein to the deep inguinal ring is a key surgical maneuver in rendering the patient disease free. Moreover, in patients in whom chemotherapy was initiated prior to orchiectomy, radical orchiectomy of the initiating testicle is performed at the time of RPLND to complete curative management. We evaluate the pathological findings of full gonadal vein dissection and the orchiectomy specimens in patients who undergo PC-RPLND for metastatic non-seminomatous germ cell cancer.
Method: All PC-RPLNDs from a tertiary institution in British Columbia were reviewed from 1990-2010. Two different searches were performed. We reviewed all PC-RPLND cases with pathologic analysis of the gonadal vein, as well as PC-RPLND cases with orchiectomy of the cancerous testicle.
Results: 117 PC-RPLNDs were performed with pathological analysis of the lymph node tissue and ipsilateral gonadal vein. Size of masses ranged from 2-20 cm. 106 gonadal veins and peri-gonadal tissue were negative for disease. 7 had evidence of teratoma, 2 had embryonal tissue, 1 and 1 were positive for choriocarcinoma and mixed germ cell tissue respectively. Of the 11 positive samples, 5 had invasive disease within the gonadal vein and 6 had peri-gonadal node disease. Positive gonadal vein pathology correlated with the RPLN pathology in all 11 cases. The second search revealed 23 cases in which orchiectomy was performed at time of PC-RPLND. 16 testicle specimens had no evidence of disease and 7 revealed teratoma. The RPLND resulted in 14 of node dissections negative for disease, 7 and 2 detected teratoma and mixed germ cell disease respectively.
Conclusion: With the goal of the PC-RPLND being complete cure, the added morbidity of the gonadal vein dissection and orchiectomy is justified. These steps are essential to maximize treatment.

UP-050

Successful Implementation of a Communities of Practice (CoP) Model to Facilitate Quality Improvement Initiatives in Prostate Cancer Surgery

Preston MA[1], Breau RH[1], Morash R[3], Fung Kee Fung M[3], Fergusson DA[2], Cagiannos I[1], Morash C[1]
[1]Division of Urology, Department of Surgery, University of Ottawa, Ottawa, Ontario, Canada; [2]Ottawa Health Research Institute, Ottawa, Ontario, Canada; [3]The Ottawa Hospital Cancer Centre, Ottawa, ON, Canada
Introduction and Objective: Communities of Practice (CoP) in the context of cancer surgery have been previously described as "regional collaboratives" structured to link Quality Improvement initiatives to individual and group professional development. This platform has the potential to greatly enhance the collaboration within the multidisciplinary cancer team both at the intra-disciplinary and inter-disciplinary levels to improve the quality of cancer surgery care. We describe the successful implementation of a novel regional prostate cancer surgery model designed to provide high quality care in a defined geographic region (Champlain Regionof Ontario; population 1.2 million).
Methods: In 2006, the Champlain Regional Prostate Cancer Surgery CoP formed with representatives from five hospitals, 3 of which perform Radical Prostatectomy (RP). The CoP includes all surgeons performing RP, pathologists and radiologists from each hospital, hospital administrators, a regional CoP Advance Practice Nurse and a designated nurse care facilitator at each hospital. As a result, the following keys to improving quality of surgical care were identified: regional infrastructure; development of

a comprehensive Cancer Assessment Clinic (CAC); regional participation in Multidisciplinary Cancer Conferences (MCC's); development of cancer surgery standards; and sharing of performance data at regular regional workshops. Here we will present prospectively-collected performance data and quality initiative measurements.
Results: Over the 5 year period from 2006-2010, regional utilization of a locally created Assessment Guideline is now 100%. Participation in MCC's has increased by 280%. A central CAC opened in 2007. Utilization uptake of a standardized regional Clinical Pathway has gone from 40% to 70%. Individual surgeon case volumes and margin status data are presented regionally every 6 months. PT2 positive margin data improved at every hospital in the CoP. For Hospital 1 the pT2 positive margin improved from 18% in 2006 to 9% in 2010 (212 cases per year). Hospital 2 improved from 31% to 17% (43 cases per year) and Hospital 3 from 50% to 25% (26 cases per year).
Conclusion: The Champlain Regional Prostate Cancer CoP represents a unique model of healthcare delivery linking continuing professional development to implementation of evidence-based standards in order to facilitate quality improvement initiatives in prostate cancer surgery.

UP-051

Comparison of Open and Minimally Invasive Partial Nephrectomy for pT1b Renal Tumors

Power Nicholas, Ghoniem Tarek, Sprenkle Preston, Silberstein Jonathan, Touijer Karim, Coleman Jonathan, Russo Paul
Department of Surgery, Memorial Sloan-Kettering Cancer Center, New York, NY, USA
Introduction and Objective: The indication for partial nephrectomy in the treatment of renal cell carcinoma is evolving, particularly for larger, more complex tumors. The following study compares the current treatment modalities of minimally invasive (MISPN) and open (OPN) partial nephrectomy for T1b tumors. Perioperative, oncologic and functional outcomes were analyzed for each technique with intermediate follow-up.
Methods: A total of 2290 patients who underwent partial nephrectomy at Memorial Sloan-Kettering Cancer Center by 15 urologic oncologists were identified after IRB approval from January 2002 through July 2010. Of these, 236 patients with pT1b renal cortical tumors were reviewed. 188 patients underwent OPN and 48 underwent MISPN (31 laparoscopic and 17 robotic assisted). All perioperative management was uniform on clinical pathway. Perioperative data, clinicopathologic variables, complications within 30 days and oncologic outcomes were reviewed. Fisher exact and Chi-square tests were used for descriptive statistic analysis.
Results: Median follow-up for OPN and MISPN was 68.3 and 30.9 months, respectively. There were no significant differences in age, gender, 30 day change in baseline eGFR, laterality, EBL, transfusion rates, histological subtype, tumor size, and margin status between procedures. Univariate analysis revealed significant differences in preop ASA score (higher scores in MISPN vs OPN, p=0.007), preoperative eGFR (OPN 68.1 mL/min/m^2, MISPN 62.7 mL/min/m^2; p=0.024), renal artery clamp time (OPN 41 min, MISPN 36.5; p=0.012), renal hypothermia (OPN 80%, MISPN 6%; $p\leq$0.001), median operative times (OPN 159 min, MISPN 242 min; p<0.001) and median length of stay (OPN 4d, MISPN 3; p=0.006). Postoperative pain medication use revealed no difference between techniques. 2 conversions to open occurred in the MISPN group. 18 (9.6%) planned OPN cases were converted to radical nephrectomy. There were no cancer specific deaths. One local recurrence and 4 metastasis events occurred in the OPN group (median 41.3 months to event). There was no difference in ≥grade 3 complications (OPN 6.9%, MISPN 9.6%; p=0.08) or urine leak requiring intervention (OPN 3.9%, MISPN 4.2%; p=0.59).
Conclusion: In this series with limited follow up, OPN and MISPN procedures for pT1b tumors appear to be comparable in terms of operative, functional and convalescence outcomes. MISPN were associated with less renal ischemia time and shorter LOS. OPN was associated with more renal hypothermia and shorter operative times. Further follow up is needed to evaluate for oncologic endpoints of local and distant recurrences.

UP-052

Intraoperative Mannitol Use Does Not Improve Long-Term Renal Function Outcomes after Partial Nephrectomy

Power Nicholas, Savage Caroline, Silberstein Jonathan, Mazzola Clarisse, Touijer Karim, Russo Paul, Coleman Jonathan
Memorial Sloan-Kettering Cancer Center, New York, NY, USA
Introduction and Objective: Evidence for the prevention of renal injury by prophylactic intravenous mannitol infusion leading to lasting improvement in kidney function is absent in the partial nephrectomy literature. The aim of this study is to compare the renal function outcomes of patients undergoing partial nephrectomies in those who did and did not receive intravenous mannitol.
Methods: After institutional review board approval, retrospective chart review of 287 consecutive patients who underwent elective laparoscopic or robot-assisted laparoscopic partial nephrectomy from January 2005 through July 2010 at Memorial Sloan-Kettering Cancer Center was completed. Mannitol use was inconsistent and was preferentially omitted by one surgeon. Exclusion criteria included missing estimated glomerular filtration rate (eGFR) data (6 patients). Statistical analyses were performed using STATA. A multivariable generalized estimating equation (GEE) linear model was created that predicted eGFR based on multiple pre- and intraoperative variables. To illustrate the relationship between time from surgery and eGFR, we plotted the adjusted GFR by time after surgery separately for those who did and did not receive mannitol.
Results: Out of 281 cases reviewed, 164 patients received mannitol and 117 did not. Those who received mannitol had better preoperative eGFR (median 68 vs 61 mL/min/m^2, p=0.032) and were more likely to have an American Society of Anesthesiologists score of ≤4 (42% vs 53%, p=0.006) than those who did not. However, they were also more likely to undergo warm ischemia (98% vs 88%, p=0.001). The groups did not differ in pathologic stage, tumor size, pathologic grade, ischemia time, or age. Overall, the recovery of renal function was very similar in both groups (p=0.8 for effect of mannitol in the GEE model). The predicted eGFR for a typical patient 2 months after surgery was 62 mL/min/1.73m^2 for both for those who did and did not receive mannitol; at 6 months the respective predicted eGFR measurements were 63 and 64 mL/min/1.73m^2.
Conclusions: This study suggests that intravenous mannitol infusion does not protect against renal injury during laparoscopic partial nephrectomies. Prospective randomized studies should be completed to determine the benefit or harm of mannitol in this setting before recommending further use.

UP-053

Significance of a Positive Tumor Thrombus Margin In Pt3bn0m0 Renal Tumors

Power Nicholas, Cohen Seth, Silberstein Jonathan, Touijer Karim, Russo Paul, Coleman Jonathan
Memorial Sloan-Kettering Cancer Center, New York, NY, USA
Introduction and Objective: The significance of a positive renal tumor thrombus margin (PRTTM) has not been elucidated. The objective of this study was to compare survival outcomes in patients with positive and negative renal tumor thrombus margins after surgical treatment of pT3bN0M0 tumors.
Methods: We identified 338 patients with pT3bN0M0 renal tumors who received treatment at MSKCC between 1999 and 2010. Exclusion criteria included neoadjuvant therapy, metastatic disease, or positive surgical margins other than tumor thrombus. PRTTM was limited to level 1 tumor thrombi and excluded positive renal vein wall and IVC wall margins to avoid heterogeneity. Of the 146 patients included in the final analysis, 28 had PRTTM and 118 had negative margins (NM). Clinical and pathological features were compared using Chi square analysis, Mann Whitney U and Fisher exact tests. Survival analysis was completed using the Kaplan–Meier method.
Results: Median age was 64.0 years, and median follow up was 22.4 months (NM 23.5 months, PRTTM 20.4 months). The PRTTM cohort differed significantly from the unmatched NM group in greater male incidence (82% vs 62%, p=0.042), larger tumor size (9.8 vs 7.8 cm, p

=0.006), right-sided laterality (82% vs 58%, p=0.026), younger age (59.1 vs 64.5 years, p=0.026), and increased intraoperative blood loss (1,332 vs 514 mL, p=0.003). None of the patients received adjuvant therapy. There were no local venous recurrences in either group. However, 2 patients had evidence of portal vein thrombi associated with hepatic metastases and 1 patient had splenic vein thrombus associated with a pancreatic metastasis on follow up. Multivariate analysis revealed that right-sided laterality was significantly associated with poorer overall survival (OS) (p=0.021), but PRTTM was not. The 5 year OS, recurrence free survival (RFS), and cancer specific survival (CSS) for the PRTTM group was 68%, 77%, and 88% vs 56%, 71%, and 92% for the NM group. Differences in OS, RFS, and CSS were not significant compared by log-rank.

Conclusions: Analysis of this series suggests that thrombus vascular margins are not independently associated with adverse survival outcomes in patients with pT3bN0 renal tumors. Nor was any association with isolated local vascular recurrence observed. Right-sided tumor thrombi had a greater risk of positive thrombus margins, possibly due to shorter right renal vein length.

UP-054

Environmental Impact of Minimally Invasive Surgery in the United States: An Estimate of Direct and Indirect CO2 Footprint

Power Nicholas, Silberstein Jonathan, Ghoneim Tarek, Guillonneau Bertrand, Touijer Karim

Department of Surgery, Memorial Sloan-Kettering Cancer Center, New York, NY, USA

Introduction and Objective: Minimally invasive surgery (MIS) has led to a paradigm shift in surgically treated conditions over the past 30 years. Carbon dioxide (CO2) is the principle gas used in these procedures for insufflation. The levels of CO2 emission are projected to be 250% increased in the year 2100 compared to baseline levels in 1750. Increase in CO2 production may lead to global warming due to the Greenhouse effect with potentially dire environmental consequences. The aim of this analysis is an attempt to quantitate the carbon footprint of MIS through measurable direct and indirect factors in order to identify its potential role in global warming in comparison to open surgery.

Methods: The number of MIS procedures was determined from ICD-9 CM codes in the 2006 Nationwide Inpatient Sample collected by the Healthcare Cost and Utilization Project. Direct CO2 emissions are a result of CO2 gas that is used during MIS procedures for insufflation. Calculations were based on both escaping procedural CO2 and eliminated metabolic CO2 via respiration into the atmosphere. Indirect calculations used the Environment Input-Output Life-Cycle Assessment model and publicly available carbon emission calculators. Calculable processes prior to surgery were broadly categorized as CO2 capture/compression and transportation to hospitals. Post-procedure CO2 emissions were calculated relating to single use equipment unique to MIS (not used in open surgery). All other emissions were considered to be equivalent to open surgery for purposes of comparison.

Results: There were 2,616,522 procedures included. The total number of hours of operative time was estimated at 2,961,498 that translated into 806,948 CO2 cylinders. The total CO2 direct emissions were 56.5 tons. The subtotal of CO2 emissions for industrial gas manufacturing, power generation and supply, and gas extraction was calculated as 1,862,700 tons. The overall CO2 emissions from MIS were estimated at 1,866,106.5 tons/year. While this totals only 0.4% of the entire calculated US healthcare carbon emission, it amounts to driving a medium sized car 83,626 times around the earth at the equator or 3 million flights from New York City to London. Still another way, MIS in the United States amounts to more CO2 emission/year than 129 entire country's yearly CO2 emissions as listed by the UN from 2007 data. It would rank 84th overall between Estonia and Lithuania.

Conclusion: The CO2 emission of MIS in the United States has a significant environmental impact. This should be considered in larger strategies to reduce healthcare's carbon footprint while maximizing healthcare quality.

UP-055

The Importance of Integrin-Linked Kinase in the Regulation Of Bladder Cancer Invasion

Matsui Yoshiyuki[1,2], Assi Kiran[3], Ogawa Osamu[4], Raven Peter A[1,2], Dedhar Shoukat[5,6], Gleave Martin E[1,2], Salh Baljinder[3], So Alan I[1,2]

[1]The Vancouver Prostate Centre, Vancouver, BC, Canada; [2]Department of Urological Sciences, University of British Columbia, Vancouver, BC, Canada; [3]The Jack Bell Research Centre, Vancouver, BC, Canada; [4]Department of Urology, Graduate School of Medicine, Kyoto University, Kyoto, Japan; [5]Department of Cancer Genetics and Developmental Biology, British Columbia Cancer Research Centre, British Columbia Cancer Agency, Vancouver, BC, Canada; [6]Department of Biochemistry and Molecular Biology, University of British Columbia, Vancouver, BC, Canada

Introduction and Objective: Integrin-linked kinase (ILK) is a major signalling integrator in mammalian cells and plays an important role in epithelial-mesenchymal transition (EMT), and thus invasiveness of human cancers, however the mechanisms of ILK are not completely understood. In this study, we investigated the importance and mechanisms of ILK in bladder cancer progression.

Methods: Eleven bladder cancer cells lines were evaluated for expression of ILK and other pathways related to EMT using western blot analyses and categorized as epithelial-like or mesenchymal-like. ILK expression was also assessed by immunohistochemical staining in *N*-butyl-*N*-(4-hydroxybutyl) nitrosamine (BBN)-induced murine bladder cancer. To assess the effects of ILK on EMT pathways, ILK was over-expressed in epithelial 253J cells using an ILK vector and inhibited in invasive TCCsup and UMUC3 cells with short interfering RNA (siRNA). To assess the role of glycogen synthase kinase 3β (GSK3β), expression was increased in 253J cells by LiCl treatment. For all experiments, pathway expression, cell viability, migration and invasion were assessed with western blotting, MTS, wound healing and matrigel assays, respectively. ILK, E-cadherin and matrix metalloprotease 9 (MMP-9) were evaluated in non-invasive and invasive cancer using a human bladder tissue microarray (TMA).

Results: ILK had a tendency to be overexpressed in invasive cell lines and in invasive BBN-induced murine bladder cancer.of ILK in 253J bladder cancer cells suppressed E-cadherin expression, likely through the GSK3β-Zeb1 pathway and promoted cell invasion. Conversely, ILK knock-downE-cadherin and MMP-9. Finally, the results of TMA analysis showed that ILK expression relates to the invasiveness of human bladder cancer.

Conclusions: Our study suggests that ILK is overexpressed in invasive bladder cancer and plays an important role in the EMT of bladder cancer via the control of E-cadherin and MMP-9 expression. ILK may be a new molecular target to suppress tumor progression in advanced and high-risk bladder cancer patients and our results provide the pre-clinical proof of principle to further evaluate the benefits of ILK inhibition in bladder cancer.

UP-056

A Population-Based Competing-Risks Analysis of the Survival of Patients Treated with Nephroureterectomy for Upper-Tract Urothelial Carcinoma

Sun Maxine[1], Jeldres Claudio[1,2], Liberman Daniel[2], Ismail Salima[2], Johal Rupinder[2], Morgan Monica[2], Shariat Shahrokh F[3], Widmer Hugues[2], Perrotte Paul[2], Karakiewicz Pierre I[1,2]

[1]Cancer Prognostics and Health Outcomes Unit, University of Montreal Health Center, Montreal, QC, Canada; [2]Department of Urology, University of Montreal Health Center, Montreal, QC, Canada; [3]Department of Urology, Weill Medical College of Cornell University, New York, NY, USA

Introduction: We sought to devise a tool capable of indicating the rates of cancer-specific mortality (CSM) and other-cause mortality (OCM) after nephroureterectomy (NU) for upper-tract urothelial carcinoma (UTUC), according to patient age and disease stage.

Methods: Relying on 17 registries from the Surveillance, Epidemiology and End Results database, 6078 patients with UTUC were treated with NU, between years 1988 and 2006. Patients were stratified according to age and tumor stage categories, which resulted in 20 strata. Poisson

regression models were fitted to obtain estimates of CSM and OCM rates at five years after NU.
Results: CSM was proportional to disease stage and OCM was proportional to patient age. CSM was stable across age categories in patients with localized disease (pT1-2N0/x) but increased according to age in patients with locally-advanced disease (pT3-4N0/x and pTanyN1-3). For example, in patients with pT4N0/x disease, the estimated five-year CSM rate increased from 19.9% in patients ≤59 years old to 29.1% in patients ≥80 years old (p<0.001). Conversely, the effect of OCM was more important in patients with localized disease relative to patients with locally-advanced disease.
Conclusions: The current findings provide a clinically applicable and valuable graphical aid for prediction of CSM and OCM, according to UTUC disease stage and patient age. It may assist clinicians in better stratifying patients according to the risk-benefit ratio of NU.

UP-057

Stage-Per-Stage Analysis of Age and Cancer-Specific Mortality in Patients with Renal Cell Carcinoma: A Retrospective Analysis

Sun Maxine[1], Abdo Al'a[1,2], Jeldres Claudio[1,2], Ismail Salima[2], Liberman Daniel[2], Morgan Monica[2], Shariat Shahrokh F[3], Pharand Daniel[2], Perrotte Paul[2], Karakiewicz Pierre I[1,2]
[1]Cancer Prognostics and Health Outcomes Unit, University of Montreal Health Center, Montreal, QC, Canada; [2]Department of Urology, University of Montreal Health Center, Montreal, QC, Canada; [3]Department of Urology, Weill Medical College of Cornell University, New York, NY, USA

Introduction: Controversy exists in the management of elderly patients with renal cell carcinoma (RCC). Some reports suggest that in these patients, surgical treatment may not represent the most optimal option, while others recommend it. We sought to test this hypothesis in a large population-based North American cohort.
Methods: Between years 1988 and 2006, 36333 RCC patients treated with partial or radical nephrectomy (RN) were identified within the Surveillance, epidemiology and end results database. Patient age was stratified into decades: <50 vs 50–59 vs 60–69 vs 70–79 vs ≥80 years old. Disease stage was defined according to the AJCC/TNM staging system: stage I vs stage II vs stage III vs stage IV. Tumor grade was defined low (I–II) vs high (III–IV). Cox regression analyses were performed for prediction of cancer-specific mortality (CSM) in the entire population, then repeated according to AJCC stage and grade categories. Finally, we repeated our analyses in patients treated with exclusively RN.
Results: Respectively 18, 25, 27, 23, and 7% of patients were aged <50, 50–59, 60–69, 70–79, and ≥80 years. Most patients were white (82%), underwent a RN (80%), clear cell (89%), low grade (74%), and stage I (67%). After adjusting to all covariates, persons aged ≥80 years had a higher rate of CSM than their younger counterparts (hazard ratio [HR]: 2.3, p<0.001). This effect was consistent in the stage per stage analysis: stage I HR: 5.1, p<0.001 vs stage II HR: 2.0, p<0.001, stage III HR: 1.8, p<0.001, stage IV HR: 1.7, p<0.001. Following stratification of patients according to stage and grade categories, the effect of worse survival in octogenarians persisted across all categories. Furthermore, this finding remained unchanged in patients treated with exclusively RN.
Conclusions: More advanced age is an independent predictor of higher CSM across all stage and grade categories after nephrectomy. Further studies are needed to confirm these results.

UP-058

Diffusion of Laparoscopic Procedure in the United States: Surgical Trends, Complications, Length of Stay, and In-Hospital Mortality

Sun Maxine[1], Jeldres Claudio[1,2], Abdo Al'a[1,2], Liberman Daniel[2], Trihn Quoc-Dien[2], Ismail Salima[2], Widmer Hugues[2], Shariat Shahrokh F[3], Perrotte Paul[2], Karakiewicz Pierre I[1,2]
[1]Cancer Prognostics and Health Outcomes Unit, University of Montreal Health Center, Montreal, QC, Canada; [2]Department of Urology, University of Montreal Health Center, Montreal, QC, Canada; [3]Department of Urology, Weill Medical College of Cornell University, New York, NY, USA

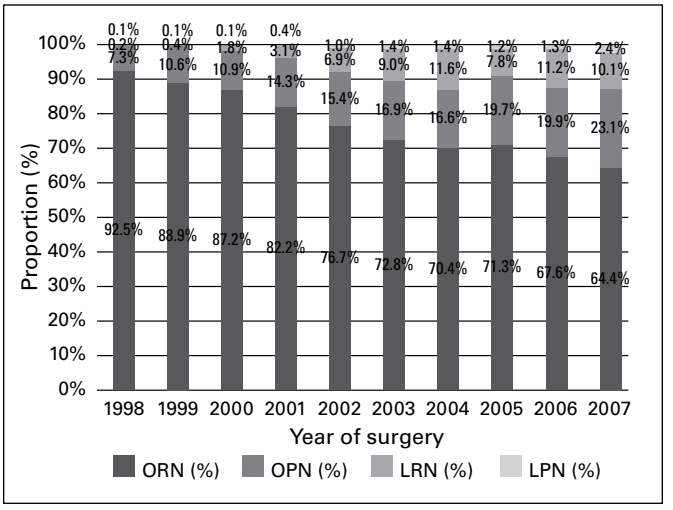

Fig. 1. UP-058

Introduction: The use of laparoscopic procedure has been associated with several established and several potential advantages for patients undergoing nephrectomy for non-metastatic renal cell carcinoma (RCC). This hypothesis was tested in a large population-based retrospective cohort.
Methods: Between 1998 and 2007, 3998 (8.3%) laparoscopic and 44323 (91.7%) open nephrectomies were performed within the Nationwide Inpatient Sample for patients with non-metastatic RCC. We assessed the utilization rates of laparoscopic partial (LPN) and radical nephrectomies (LRN), as well as those of open partial (OPN) and radical nephrectomies (ORN) throughout the study period. We further assessed patient characteristics, complications, in-hospital mortality, and length of stay in the two types of procedures. Finally we assessed the determinants of laparoscopic use using logistic regression models.
Results: Overall, important surgical trends were observed over the study span (1998–2007, Figure 1): ORN declined (92.5 to 64.4%), LRN increased (0.2 to 10.1%), OPN increased (7.3 to 23.1%), and LPN increased (0.0 to 2.4%, all p<0.001). Patients who underwent the laparoscopic procedure were younger (≤59 years: 43 vs 41%, p=0.03), had a lower Charlson Comorbidity Index (CCI 0: 66 vs 62%, p<0.001), and were predominantly white (62 vs 58%, p=0.001) than those who underwent the open procedure. More laparoscopic procedures were performed in academic hospitals (70 vs 55%, p<0.001), at high-volume institutions (50 vs 33%, p<0.001), and in the most contemporary year of surgery tertile (2005–2007: 52 vs 36%, p<0.001). Lymph node dissections were less frequently performed with the laparoscopic procedure (5 vs 9%, p<0.001). The rate of any complication was lower in patients who underwent laparoscopic procedure (12 vs 16%, p<0.001). Similarly, LRN or LPN patients had a shorter length of stay (>5 days: 24 vs 51%, p<0.001) and a lower rate of in-hospital mortality (0.4 vs 0.8%, p=0.02). After adjusting for all covariates, partial nephrectomies (odds ratio [OR]: 2.1, p<0.001), octogenarians (OR: 1.4, p<0.001), high hospital volume (OR: 1.8, p<0.001), and more contemporary year of surgery (2005–2007 OR: 5.8, p<0.001) were associated with higher rate of undergoing laparoscopic procedure. In contrast, black race (OR: 0.8, p<0.001), worse health status (CCI≥4 OR: 0.7, p<0.001), non-teaching institutions (OR: 0.6, p<0.001) were associated with a lower rate of undergoing laparoscopic procedure.
Conclusions: Our data confirm that laparoscopic nephrectomies significantly increased over time and yielded better postoperative outcomes in all the examined endpoints. In consequence, either LRN or LPN should be performed wherever the expertise allows it.

UP-059

Radiofrequency Ablation of Renal Cell Carcinoma: A 4-Year Follow Up

Thwaini Ali, Pahuja Ajay, Hameed Ammar, Loan Willie, Thiagarajan Nambirajan
Belfast City Hospital, Belfast, Northern Ireland

Objectives: To present the oncological outcomes in a series of patients with cT1a renal cell carcinoma (RCC) treated with radiofrequency ablation (RFA) and its effect on the glomerular filtration rate (GFR).

Methods: We reviewed the records of 45 patients (48 renal units) treated at the Belfast City Hospital, between January 2006 and March 2010. Average age is 61.5 years (range 41-80). Eighteen patients (22 renal units) were included with American Society of Anesthesiologists (ASA) II and III. The rest were ASA I. Average tumour size was 2.63 cm (range 1.2-4 cm). A good response was defined by either disappearance of the lesion treated or a persistent non-enhancing lesion of smaller size during follow up. A partial response was defined by a persistent but non-enhancing lesion of similar size. Non responding lesions were defined by persistent/increasing lesions that are still enhancing. Renal function before and after RFA was recorded by means of the estimated glomerular filtration rate (eGFR) and the changes are presented.

Results: Mean follow up was 12.1 months (3-48 months). A good response was found in 33 (74%) patients. A partial response was found in 3(8%) patients and no response was identified in 8(18%) patients. The average reduction in eGFR was 11ml/min.

Conclusion: RFA presents reasonable treatment choice for patients with RCC, particularly those that are high risk surgical candidates and those who refuse surgery. Short term results suggest variable oncological outcomes and good preservation of renal function.

UP-060

Do Statins Have an Impact on the Recurrence and Progression of Non-Muscle-Invasive Urothelial Carcinoma of the Bladder?

Yafi Faysal A, Segal Robert, Tanguay Simon, Aprikian Armen G, Kassouf Wassim
Division of Urology, Department of Surgery, McGill University Health Centre, Montreal, QC, Canada

Introduction and Objectives: Urothelial carcinoma of the bladder (UCB) is the most common malignancy of the urinary tract. Statins or HMG-CoA reductase inhibitors are a class of drugs used principally in the treatment of elevated cholesterol and in the prevention of cardiovascular events. We sought to investigate any potential prognostic role of statins' use on the course of non-muscle-invasive bladder cancer (NMIBC).

Methods: Records of 2570 patients with UCB treated at a single academic institution from 1995-2005 were retrospectively reviewed. Only patients who had complete medication records were included in the analysis. Collected variables included age, gender, Charleson score, smoking, number of tumors, tumor stage, grade, stage, presence of concomitant cis, use of mitomycin, use of BCG and the use of medications such as statins, NSAIDS, metformin and alpha-blockers. Fischer's exact test was used to calculate probabilities and multivariate Cox proportional regression analysis methods were employed to verify the prognostic significance of various variables.

Results: A total of 1484 patients were noted to have complete medication information of which 217 (14.6%) were taking statins when first diagnosed with NMIBC. On univariate analysis, the parameters Charleson score, smoking, number of tumors, grade, concomitant cis, stage, use of mitomycin and the use of NSAIDs but not statins were independent prognostic factors for recurrence; while the parameters age, Charleson score, tumor size, grade, stage and the use of NSAIDs but not statins were independent prognostic factors for stage progression. Similarly, on multivariate analysis, statins were not associated with either disease recurrence or stage progression.

Conclusions: The present data do not support neither positive or negative associations between statins use and the recurrence or progression of bladder cancer. They do, however, suggest a potentially adverse effect of NSAIDs on these outcomes. Further studies are needed to validate these results.

UP-061

Could Screening for Bladder Cancer Produce a Stage Migration Towards Detection of Non-Muscle-Invasive Cancers?

Zlotta Alexandre R[1,2], Roumeguere Thierry[3], Al-Khateeb Sultan[1], Rorive Sandrine[4], Lemy Anne[5], van der Kwast Theodorus H[6], Fleshner Neil E[1], Jewett Michael A[1], Finelli Antonio[1], Schulman Claude[3], Kuk Cynthia[1], Lotan Yair[7], Shariat Shahrokh F[8], Nortier Joelle[5]
[1]Department of Surgical Oncology, Division of Urology, University Health Network, Toronto, ON, Canada; [2]Department of Surgical Oncology, Division of Urology, Mount Sinai Hospital, Toronto, ON, Canada; [3]Department of Urology, Erasme Hospital, University Clinics of Brussels, Brussels, Belgium; [4]Department of Pathology, Erasme Hospital, University Clinics of Brussels, Brussels, Belgium; [5]Department of Nephrology, Erasme Hospital, University Clinics of Brussels, Brussels, Belgium; [6]Department of Pathology, University Health Network, Toronto, ON, Canada; [7]Department of Urology, The University of Texas Southwestern Medical Center, Dallas, TX, USA; [8]Department of Urology and Medical Oncology, Weill Medical College of Cornell University, New York, NY, USA

Introduction and Objective: Bladder cancer (BC) survival rates are significantly higher when patients are detected at a non-muscle invasive stage. However, more than 25% of BC cases are still muscle-invasive at first diagnosis. Currently, it is unproven whether screening enables the detection of bladder tumors at an earlier non-muscle-invasive stage. Aristolochic acid nephropathy (AAN) associated with BC was reported after intake of slimming pills containing Chinese herbs. We evaluated whether a BC screening protocol in this high-risk and unique patient population impacted the stage of tumor presentation.

Methods: 48 AAN affected patients from Erasme Hospital, University of Brussels, Belgium were enrolled in a screening program, establishing BC incidence during prospective screening cystoscopies and biopsies bi-annually for up to 10 years.

Results: BC was diagnosed in 25 patients (52%). Among 43 patients who underwent screening cystoscopies (mean follow-up: 87.6 months), 22 were first diagnosed with non-muscle-invasive BC but none with muscle-invasive tumors. These patients were treated conservatively. Upon BC recurrence, conservative or radical treatment was administered and no patient died of BC. Notably, 3 women who declined screening were diagnosed and died with advanced metastatic disease. The limitations of our findings include the small sample size of this case series, the absence of a real control group and the particular risk factor in these patients which is different from the usual risk factors like smoking or industrial chemicals.

Conclusions: BC screening in high risk groups may allow identification of tumors prior to muscle-invasion. The optimal screening schedule and the relevance of the present findings in smoking-related-BC remain to be defined