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MP-08.01

Pre-operative risk stratification of disposition outcomes for patients considering radical cystectomy

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Objectives: Utilizing administrative data, we sought to develop a clinically useful model, combining age and co-morbidity status to determine the risk of meaningful outcomes following radical cystectomy.

Methods: From the Premier Perspectives Database, we identified patients who underwent radical cystectomy for bladder cancer between 2007-2013 using ICD-9 codes. Comorbidity was determined using the Elixhauser method. Outcomes examined included: prolonged length of stay (LOS), disposition to skilled nursing facility (SNF), mortality on index admission, and hospital readmission rates following radical cystectomy. Prolonged LOS was defined as admissions exceeding 10 days. Hospital readmissions were flagged if they occurred in the month of surgery or the month after regardless of the reason. Probabilities were derived from multivariable logistic regression models that additionally adjusted for provider volume (based on quartiles), payer, patient marital status, and hospital urban/rural status.

Results: We identified 6460 radical cystectomy patients, of whom 16% were discharged to a SNF, 37% had a prolonged LOS, and 2% died during the index admission. Among patients who were discharged home after surgery, 27% were readmitted. Prolonged LOS was associated with increasing comorbidities and age > 70 ($p<0.001$). The adjusted likelihood of readmission increased with increasing burden of comorbid conditions (Table 1, $p<0.001$), however, was not associated with age group. The likelihood of being discharged to a SNF increased with increasing age and increasing number of comorbidities ($p<0.001$). Mortality was associated with 3 or more comorbidities and age >70.

Conclusions: We present adjusted disposition and mortality rates following radical cystectomy for bladder cancer stratified by patient age and comorbidity. These data may inform preoperative patient counseling regarding the potential for prolonged recovery and mortality and facilitate improved shared decision-making between patients and clinicians anticipating cystectomy for bladder cancer.

Table 1. MP-08.01

Outcome	Number of comorbidities	Age group					All
		18–49	50–59	60–69	70–79	80–89	
Prolonged LOS	0	20%	18%	20%	24%	26%	21%
	1	25%	24%	25%	30%	33%	27%
	2	31%	28%	30%	34%	37%	32%
	3	38%	33%	36%	41%	43%	39%
	4+	53%	49%	52%	57%	59%	55%
	All	30%	29%	33%	40%	44%	37%
Discharge to SNF	0	1%	2%	3%	7%	12%	4%
	1	2%	4%	5%	13%	24%	10%
	2	3%	5%	7%	16%	26%	13%
	3	4%	6%	9%	20%	35%	17%
	4+	8%	13%	18%	34%	49%	30%
	All	3%	5%	9%	21%	34%	16%
Index mortality	0	0%	1%	1%	1%	2%	1%
	1	1%	1%	1%	3%	3%	2%
	2	1%	1%	1%	3%	3%	2%
	3	1%	2%	2%	5%	6%	4%
	4+	2%	2%	3%	6%	9%	5%
	All	1%	1%	2%	4%	5%	3%
Radmission	0	22%	19%	21%	19%	20%	20%
	1	25%	22%	23%	22%	23%	23%
	2	30%	25%	27%	25%	25%	26%
	3	33%	28%	30%	29%	29%	29%
	4+	36%	31%	34%	32%	32%	32%
	All	28%	24%	27%	27%	27%	27%

MP-08.02

Determining the best complete blood count-based biomarker for oncologic outcomes following radical cystectomy for urothelial carcinoma of the bladder

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Introduction: Several pre-treatment complete blood count (CBC)-based markers have prognostic value for patients underoing radical cystectomy (RC), such as neutrophil-to-lymphocyte ratio (NLR) (Hermanns T, Bhindi B, Wei Y et al. Br J Cancer. Jul 29 2014;111(3):444-451), monocyte-to-lymphocyte ratio (MLR), platelet-to-lymphocyte ratio (PLR), and haemoglobin (Hb) level. Our objective was to determine which combination of these biomarkers has the best predictive value for oncologic outcomes in patients undergoing RC for bladder cancer (BC).

Methods: Our institutional database of patients undergoing RC (1992-2012) was analyzed. The following biomarker values were obtained based on CBCs performed pre-RC, or before neo-adjuvant chemotherapy where applicable: Hb level, NLR, MLR and PLR. The outcome measures were recurrence-free survival (RFS), cancer-specific survival (CSS), and overall survival (OS). The 4 CBC-based biomarkers, along with age, gender, Charlson Score, T-stage, and N-stage, were considered for inclusion in predictive multivariable Cox models. Models that minimized the Aikeke Information Criterion, representing models that have the best predictive ability while simultaneously minimizing the number of predictors, were selected.

Results: Our cohort included 418 patients (median follow up of 58.4 mo). All CBC-based biomarkers were significant predictors of RFS, CSS and OS in univariate analyses. NLR, T-stage and N-stage were included in all 3 models. Hb and age were included in models predicting CSS and OS, while Charlson Score was included in the model for OS. NLR was the only CBC-based biomarker with criteria for inclusion into the model predicting RFS (HR per 1-log unit increase=1.46, 95%CI=1.13-1.87, p=0.003). NLR was also independently predictive of CSS (HR per 1-log unit increase =1.43, 95%CI=1.09-1.90, p=0.01) and OS (HR per 1-log unit increase=1.50, 95%CI=1.07-2.09, p=0.02). Hb was also independently predictive of CSS (HR per 1g/L increase=0.93, 95%CI=0.89-0.97, p<0.001) and OS (HR per 1g/L increase =0.91, 95%CI=0.89-0.94, p<0.001).

Conclusions: Among all of the CBC biomarkers studied in our dataset, NLR was found to be the best marker for predicting RFS, while NLR and Hb were the best markers for predicting CSS and OS. NLR and Hb are cost-effective and efficient biomarkers for predicting oncologic outcomes for BC following RC.

MP-08.03

Factors associated with surgical site infections following radical cystectomy

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Introduction and Objectives: Surgical site infections (SSI) are significant postoperative complications for radical cystectomy patients. Our objective was to identify factors associated with risk of SSI following radical cystectomy.

Methods: This was a historical cohort study of radical cystectomy patients in the National Surgery Quality Improvement program (NSQIP) database between 2006 and 2012. The primary outcome was development of a surgical site infection (superficial, deep, or organ/abdominal space) within 30 days of surgery. Baseline characteristics such as age, gender, comorbidities, resident involvement, year of surgery, length of surgery, neoadjuvant chemotherapy, pre-op albumin level, BMI, diabetes mellitus, diversion type, and smoking status were abstracted by surgical clinical reviewers.

Results: A total of 2208 radical cystectomy patients met the inclusion criteria and 276 (12.5%) had an SSI. Of these, 141 (6.4%) had a superficial, 42 (1.9%) had a deep, and 95 (4.3%) had an organ/abdominal space SSI. The mean time to SSI was 14.2 ± 7.0 days. Factors associated with SSI were body mass index >30 (RR 1.42, 95% CI: 1.01-2.00, p=0.04), diabetes (RR 1.52, 95% CI: 1.19-1.94, p=0.007), preoperative weight loss more than 10% (RR 1.68, 95% CI: 1.05-2.6, p<0.02), and operative time >6 hours (RR 1.73 95% CI: 1.38 – 2.15 p<0.001).

Conclusions: In a large cohort of academic and community hospitals the prevalence of SSI following radical cystectomy was 12.5%. Several potential risk factors were identified which may allow for directed interventions to reduce infections in high risk patients.

MP-08.04

Risk and timing of venous thrombo-embolism after cystectomy: A population-based study in Ontario

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Introduction and Objectives: Perioperative venous thromboembolism (VTE) is common in cystectomy patients and a source of significant morbidity. (Dyer J et al, *Ann R Coll Surg Engl* 2013; **95**: 65) (Svatek RS et al, *J Urol* 2010; **183**: 929) (Clément C et al, *J Urol* 2011; **186**: 2293) Here we sought to describe the risk and timing of perioperative VTE for patients undergoing cystectomy for muscle invasive bladder cancer (MIBC) in routine clinical practice. We also evaluate factors associated with VTE and its association with survival outcomes.

Methods: Electronic records of treatment and surgical pathology reports were linked to the population-based Ontario Cancer Registry to identify all patients who underwent cystectomy between 1994-2008. Temporal trends of a diagnosis of VTE are described around the date of surgery, as well as in relation to perioperative chemotherapy. Multivariate linear regression analysis was used to determine the factors associated with a VTE diagnosis. A Cox proportional hazards regression model was used to explore the associations between VTE and cancer-specific survival as well as overall survival.

Results: The original study population included 3879 patients. Of the entire study cohort, 5.44 % (n=211) of the patients were diagnosed with a VTE within three months of their surgical admission date with 43% of those (n=90) presenting after discharge from hospital. Patients receiving neoadjuvant chemotherapy (NACT) were found to have a significant lifelong rate of VTE at 21%, with 11% occurring between the onset of NACT and three months after surgery. In multivariate analysis, factors associated with a VTE diagnosis included only surgeon volume and length of hospital stay. Nodal yield, as a surrogate for extent of dissection, and adjuvant chemotherapy were not associated with VTE risk. In adjusted analyses, a VTE diagnosis was not associated with an inferior overall (HR 1.07 (0.84-1.38)) or cancer-specific (1.18 (0.89-1.55)) survival.

Conclusions: Almost half of VTE (43%) in cystectomy patients occur after discharge from hospital. Having a VTE does not affect survival and there may be more VTE in patients who receive NACT. These results suggest there may be value in considering an extended course of pharmacologic VTE prophylaxis in patients undergoing cystectomy.

MP-08.05

Health-care services utilization and costs associated with radical cystectomy for bladder cancer: A descriptive population-based study in the province of Quebec, Canada

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Introduction and Objectives: Bladder cancer (BC) has the highest lifetime treatment costs per patient of all cancers. The aim of this study was to characterize the use of health-care services and costs associated with BC among patients who underwent radical cystectomy (RC) in the province of Quebec.

Methods: We conducted a descriptive study in a retrospective cohort of patients who underwent RC for BC between 2000 and 2009. Data was obtained from two health administrative databases (RAMQ and ISQ). We calculated average costs per patient and total costs in 2014 Canadian dollars for the following components of costs: 1) Pre-surgery costs (pre and post-urologist consultations, urologist consultations, cystoscopies, TURBTs, imaging procedures); 2) Costs of radical cystectomy and 3) Post-surgery costs (urologist consultations, post-operative consultations, medical oncologist consultations, imaging procedures and post-operative complication management). ARIMA models were used to evaluate trends in average costs per patient over the study period.

Results: Among 2759 patients included in the study (75% men), average pre-surgery costs, RC costs, and post-surgery costs were estimated at 3762$, 18979$ and 4770$, respectively. RC cost was responsible for 69% of total costs, followed by post-operative consultations (7%), post-operative complications and TURBTs (6% of total costs, each). Academic hospitals performed RC at a lower average cost, compared to community hospitals (difference of $1000, p<.0001). A decreased trend in post-surgery costs was detected in the year 2009.

Conclusions: Costs of RC, TURBT, consultations and post-operative complications were the most important economic components of total RC cost per patient in Quebec. Academic hospitals performed RC at a lower cost, compared to community hospitals.

MP-08.06

Development of an in vitro three-dimensional tissue engineered model for bladder cancer

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Introduction and Objectives: Bladder cancer (BCa) is very common in Canada. There are currently few in vitro and in vivo models to study the invasion mechanisms of malignant urothelial cells in their physiologic environment. Over the last 10 years, we have developed a unique expertise in the construction of entirely human tissue engineered three-dimensional vesical equivalents (VE). They reproduce the mechanical and histological characteristics of human bladder. The objective of our study was to develop non-invasive and invasive BCa models using our VE to study the invasion mechanisms involved in the progression of BCa and to test new intravesical agents.

Methods: To prepare the VE, benign human urothelial cells were plated on a stromal layer made of dermic fibroblasts and incubated at the air/liquid interface to allow differentiation. Tumors were made from SW1710, SW780 and T24 which are aggressive urothelial carcinoma cells and from RT4 which are non-aggressive low-grade urothelial carcinoma cells. Cancer cells were infected with a lentiviral vector to constitutively overexpress the DS-Red biofluorescent protein. After a 7-day growth period for microsphere formation, they were seeded on the urothelium of the VE and allowed to grow for 2 weeks. Biopsies were then taken for histologic and immunofluorescence analyses.

Results: All BCa cell lines developed as tumors on the VE. Immunofluorescence analyses revealed that Ds-Red labeled SW1710, SW780 and T24 cells were all able to migrate beyond the basement membrane in the submucosa while the RT4 did not. Invasive cells covered 2.3 to 3.2% of the surface beneath this membrane whereas none of the RT4 cells were detected in the submucosa ($p< 0.05$). They displayed behaviour in accordance with their primary BCa origin.

Conclusions: Our findings shows the potentials of this model to study in vitro the mechanisms involved in BCa invasion and the efficacy of new intravesical therapies.

MP-08.07

Radical cystectomy after irradiation for bladder cancer in Québec: A population-based analysis of outcomes

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Introduction and Objectives: Salvage radical cystectomy (sRC) is reserved for bladder cancer (BC) patients who failed irradiation as a primary modality of treatment. With reports confirming higher post-operative morbidity and mortality, our aim was to assess short and long-term outcomes in patients received post irradiation sRC across Quebec.

Methods: From 2000 to 2009, and within the RAMQ (Quebec health insurance medical services database), we identified 2988 patients who underwent RC for BC. Our cohort was established using procedure codes to identify patients who received external beam radiotherapy (EBRT) for BC in the 2 years preceding RC. The outcomes analyzed included significant post-operative complications, mortality rates at 30, 60 and 90 days and overall survival.

Results: The cohort was formed of 103 patients who had their RCs performed in 25 hospitals. The majority (72.8%) of RCs were done in academic centers. Males comprised 69.9% of the cohort and 48.5% of patients were below 65 years. Among the cohort, 30.1% had at least one post-operative complication (Grade III-IV on Clavien grading system) and 23.3% had more than one complication. Urinary tract complications came first (17.4%) followed by gastrointestinal tract complications (7.7%). Post-operative mortality rates at 30, 60 and 90 days were 2.9%, 5.8% and 6.8% respectively. The 5-year overall survival rate was 46% and the mean overall survival was 4.7 years with a death rate of 48.6% over the entire follow-up period. One-to-one matched analysis for age and sex with the original RC cohort showed no statistically significant survival difference between sRC and primary RC patients. ($P = 0.15$).

Conclusion: Our study results suggest that sRC for BC may not have worse oncologic outcomes as compared to primary RC.

MP-08.08

Resident involvement in endoscopic bladder cancer surgery is associated with inadequate pathology specimens and prolonged time to cystectomy

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Introduction and Objectives: Transurethral resection of bladder tumor (TURBT) pathology specimens lacking muscle are associated with clinical upstaging and necessitate repeat procedures, potentially delaying radical cystectomy for muscle-invasive cancers. We evaluated whether resident involvement in TURBT procedures is associated with inadequate pathology specimens and delayed time to cystectomy.

Methods: We reviewed all TURBTs performed at our institution from November 2011-June 2014. Explicit description of muscle presence/absence in pathology reports was required for inclusion. Multivariable

logistic regression models assessed associations between resident involvement and TURBT specimen adequacy adjusting for potential confounders. Time from initial high risk TURBT (high grade, ⩾T1, or CIS) to cystectomy were compared between resident and attending cohorts with the log rank test.
Results: A total 664 TURBTs were performed on 471 patients during the study period. Patient and tumor characteristics were comparable for TURBTs performed by attendings and residents. Attendings were more likely to obtain muscle in specimens for all TURBTs (OR1.68, p=0.018) and for the subset of 275 high risk TURBTs (OR1.99, p=0.019). Senior residents (PGY3–5) had higher odds of muscle in all (OR1.91, p=0.017) and high risk (OR2.9, p=0.003) specimens compared with juniors. In multivariate analysis adjusting for covariates patient age, sex, and tumor size, resident involvement was associated with inadequate tumor specimens among all patients (p=0.032) and only high risk tumors (p=0.049). Resident involvement was associated with a non-significant increased need for repeat TURBT. The median time from initial high risk TURBT to cystectomy was 73.3 (IQR 51.8, 131.4) and 49.4 (IQR 31.4, 65.7) days for residents and attendings, respectively (p=0.024).
Conclusions: Resident involvement in TURBTs is associated with inadequate pathology and delayed cystectomy. Future studies should assess educational tools to improve endoscopic surgical training techniques in order to minimize harms of resident learning on clinical outcomes.

MP-08.09
Prognostic value of urinary cytology and other biomarkers for recurrence and progression in bladder cancer: A prospective study
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Introduction: Urinary cytology and cystoscopy remain the gold standard for the detection and screening of bladder cancer (BC). In recent years multiple urinary biomarkers have been developed as non-invasive methods of bladder cancer detection. In this study we prospectively analyzed whether cytology (C), ImmunoCyt (I), BTA Stat (B), Hemoglobin dipstick (H), and NMP22 BladderChek (N) can predict recurrence and progression.
Methods: Urinary samples from 92 patients with BC were prospectively collected over an 18 month period. Baseline characteristics of the population including various clinicopathologic variables and use of intravesical therapy were collected. Specific variables tested were gender, smoking status, tumor grade and stage, multifocality, the presence of concomitant carcinoma in situ, and lymphovascular invasion. Progression and recurrence were then assessed after a median follow up of 48 months (range 0.4-84) and mean of 44.5 months. Univariate and multivariate analyses were performed by using COX proportional hazards models.
Results: On univariate analysis C (HR 1.36; p=0.26), I (HR 0.89; p=0.66), B (HR 0.80; p=0.42), H (HR 0.75; p=0.30), and N (HR 0.82; p=0.48) were not associated with recurrence free survival (RFS). In the analysis of progression free survival (PFS), C had a significant association (HR 2.67; p=0.017) where as I (HR 0.96; p=0.92), B (HR 1.38; p=0.42), H (HR 1.04; p=0.92), and N (HR 0.95; p=0.90) were not. On multivariate analysis, urine cytology was no longer significantly associated with PFS (HR 1.41; p=0.48).
Conclusions: Based on the results of this study, Immunocyt, BTA Stat, and NMP22 were not associated with neither RFS nor PFS. Whether urine cytology has a role in predicting progression requires further evaluation in a larger multicentric study.

MP-08.10
Evaluation of nutritional preoperative factors to predict the risk of complications for patients undergoing radical cystectomy
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Introduction and Objectives: Radical cystectomy (RC) carry a high complication rate and have a significant impact on patients' physical health and quality of life. The nutritional status is an important predictor of various health outcomes, including possibly surgical complications. The objective of this prospective study was to examine the relationship between pre-operative nutritional factors and risk of complications after RC.
Methods: A prospective pilot study is being conducted at our institution where modifiable preoperative factors are evaluated before RC by multiple health professionnals (nutritionist, physiotherapy, ergotherapy and social worker) in all patients. A clinical and biochemical nutritional evaluation was available in 145 patients who underwent a RC from January 2011 to November 2014. Postoperative complications were recorded and classified according to the Clavien-Dindo and MSKCC systems. Logistic regressions were conducted to estimate the risk of complications at 7, 30 and 90 days after RC, according to nutritional preoperative factors and were age-adjusted.
Results: Within this cohort, 116 patients (80%) developed at least one complication during the 90 days after RC (total of 471 complications). The risk of high-grade complications at 7 days was lower for patients with normal preoperative albuminemia (OR 0.060; 95% CI 0.005 – 0.812) and prealbuminemia (0.106; 0.013 – 0.833) when compared with patients with low albuminemia and prealbumineria. A decreased of appetite occurring in the three months before RC was associated with a high risk of bleeding complication at 30 days (2.575; 1.002 – 6.616). Preoperative weight loss occurring in the three months before RC was associated with high risk of wound complication at 30 days (3.756; 1.224 - 11.527). A high body mass index was associated with high risk of cardiac complications at 30 (1.120; 1.014 – 1.236) and 90 days (1.115; 1.013 – 1.227).
Conclusions: The pre-operative nutritional status of patients scheduled for RC may predict the occurrence of complications up to 90 days after RC. If validated, our findings suggest that future pre-operative nutritional interventions and optimization have the potential to reduce the high patient morbidity associated with RC and merit further study.

MP-08.11
Recurrence and restaging rates of T1 High Grade Urothelial Carcinoma in a resource limited system in western Canada
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Introduction and Objectives: Non-muscle invasive bladder cancer (NMIBC) is the most expensive malignancy to treat. T1 bladder cancer represents 5-20% of NIMBC. Current Canadian guidelines recommend restaging TURBT at 4-6 weeks, which is a large burden on OR usage and adds further risk/cost of complications. Internationally, major cancer centers report rates of recurrence and upstaging on repeat TUR to be 45-76% and 29-40%, respectively, necessitating repeat resection. Minimal Canadian data is available. We aimed to determine the rate of recurrence and upstaging in a multicentre, resource-limited system in western Canada.
Methods: A retrospective chart review of patients receiving TURBT between November 2009 and November 2014 was performed. Patients were included if they had all three of the following: a pathological diagnosis of T1 high grade urothelial carcinoma, adequate muscularis propria present in specimen, and a second, restaging TURBT at one of 4 hospitals in the greater Edmonton area.
Results: We reviewed the charts of 3166 patients and found 173 to meet our inclusion criteria. The average age at initial OR was 71 and 87.8% were male. The overall recurrence and upstaging rates were 57.2% and 9.2%, respectively. Recurrence was higher in patients over 65 years at initial TURBT (64.8 vs. 35.6%, p<0.001). Upstaging was increased by age

>65 (11.7 vs. 2.2%) and a time >6 weeks between initial and restaging TURBTs (10.1 vs. 5.7%), however this was not statistically significant.
Conclusions: Although recurrence rates are similar, we have found upstaging rates to be lower than those previously reported. This is important in a resource-limited setting, where a restaging TURBT changes the patient management in only a small minority of cases, while delaying intravesical BCG therapy in >90%. This emphasizes the need for larger prospective studies to identify high-risk populations for upstaging with the aim to reduce cost of NMIBC treatment.

MP-08.12

A standardized functional assessment to predict surgical complications for patient undergoing radical cystectomy

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Introduction and Objectives: Sarcopenia defined EWGSOP by low muscle mass and low muscle function(strength and performance). A small muscle mass increases the risk of post-operative complication in various cancers but we found no study examining in standardized manner the muscle function. Radical cystectomy (RC) carries a high rate of complications and has a significant impact on the physical health and quality of life of patients(pt). The objective of this study was to examine the relation between objective pre-op muscle function measures and risk of complications after RC.
Methods: From our institutional pilot prospective inter-disciplinary study of complications after RC, 104 pt undergoing RC between January 2011and November 2014 were evaluated before surgery by a physiotherapist using the Short Physical Performance Battery(SPPB) and Jamar prehension test. Complications were extracted and classified using the Clavien-Dindo and MSKCC systems. Logistic regressions models were fitted to predict the 7, 30 and 90 days cumulative complication risk after RC. Multivariable models were adjusted for age, sex, ASA and BMI.
Results: Mean Jamar score was 35.2 (SD 10.4). SPPB was split in 3 categories [≤ 8][9-11][12] and respectively have 14, 35 and 53 pt. Eighty percent of them developed ≥1 complication within 90 days. SPPB was a good predictor of severe complications (grade >=3,OR 8.65 [95%CI:1.92-39.0]; p=0.02). A very low muscle function (SPPB [≤ 8]) increased the risk of overall complication at 30 days (OR 6.67[1.28-34.5]; p=0.02) and at 90 days (OR 6.81[1.53-30.34]; p=0.007).Low strength measured by the Jamar, was associated with neurological complications at 7days (OR 0.21[0.07-0.67]; p=0.009) and at 90 days (OR 0.31[0.12-0.81]; p=0.016).
Conclusion: A pre-op evaluation of muscle function may predict the complication rate after RC. If validated, these simple tests could identify patients at high risk of complications after RC in whom targeted risk-reduction interventions could eventually be developed. More research is warranted in this understudied field.

MP-08.13

Long-term outcomes of balloon dilation for benign ureteroileal anastomotic strictures in patients who underwent radical cystectomy and urinary diversion

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Introduction and Objectives: Ureteroileal anastomotic strictures after radical cystectomy and urinary diversion pose a complex management issue. Balloon dilation has been advocated as a means to avoid the morbidity of complex reconstructive procedures. The success rate of this procedure is difficult to assess.
Methods: We retrospectively reviewed our cystectomy database from 2008–2012 and identified patients who underwent balloon dilation for confirmed benign ureteroileal anastomotic strictures. 13 patients who underwent balloon dilations and who had a minimum of 2 years of follow–up after diagnosis were included for analysis. Success of balloon dilation was defined as being free of stent, nephrostomy, or surgical intervention.
Results: 2 of 13 patients underwent neobladder and 11 underwent ileal conduit urinary diversion. Median time to stricture was 7 months. Mode of presentation was radiologic in 9 of 13 patients, reduction in eGFR in 2 and symptoms in 2. Strictures were left sided in 10 patients, right sided in 5, and bilateral in 2, for a total of 15 renal units. All 15 obstructed renal units underwent at least one attempted balloon dilation of the stricture. 1 stricture was completely obstructing open reconstruction was undertaken. Of the 14 renal units that underwent balloon dilation, 10 required at least 2 procedures. The success rate after primary treatment was 7.1%. The overall success rate after a second balloon dilation remained unchanged, for an overall failure rate of 92.9%. 9 of 14 renal units (64.3%) that underwent balloon dilation required permanent ureteric stent, nephroureteral stent or nephrostomy. 5 of 14 renal units (35.7%) underwent surgical revision, which consisted of reconstruction/reimplant in 4 patients and nephrectomy for a non–functioning renal unit in 1 patient.
Conclusions: Ureteroileal anastomotic strictures after urinary diversion pose a complex problem. Minimally invasive treatments have been advocated, including balloon dilation and endoscopic incision, but overall success rates are poor. Our single institution series showed the long–term failure rate of balloon dilation is 92.9%. Attempts at serial balloon dilations are unlikely to yield further success, and if the patient's condition permits, reconstruction or reimplant should be considered early.

UP-08.01

Radical cystectomy is associated with an increased risk of depression in the early post-operative period

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Introduction and Objectives: Radical Cystectomy with urinary diversion is a complex surgical procedure with potential for significant morbidity. Many studies have examined quality of life after radical cystectomy and urinary diversion; however there have been few prospective studies to date that report on rates of depression in this population. Using a validated questionnaire, the Beck Depression Inventory (BDI), we prospectively studied the rates of depression among patients undergoing radical cystectomy, with the hope of early identification of patients at risk.
Methods: Patients referred for radical cystectomy and urinary diversion at our center were invited to participate. We prospectively collected data on all subjects. The BDI was used 1 week pre-operatively and again at 6 weeks post-operatively. Responses were patient generated. We conducted a paired t-test analysis to assess the difference between pre- and post-operative depression scores.
Results: A total of 33 patients underwent radical cystectomy with urinary diversion. 5 patients expired before 6 weeks post-operatively and were excluded. 28 patients (23 male, 5 female) completed both pre- and post-operative depression questionnaires. 23 patients underwent ileal conduit diversion, while 5 underwent orthotopic neobladder. Mean age was 69.6 years. Mean pre-operative depression score was 8.3 (range 1-30) and mean postoperative depression score was 12.0 (range 1-28). There was a small but statistically significant (P=0.0052) difference in reported depressive symptoms post-operatively. 8 patients (27.6%) who had minimal depression pre-operatively became mild or moderately depressed after cystectomy.
Conclusions: Our small prospective study shows a statistically significant increase in depressive symptoms in the early post-operative period after radical cystectomy. We continue to accrue patients to allow for multivariate analysis, and are planning a prospective randomized study to look at the role of SSRI's during the early post-operative period.

UP-08.02

Informational and supportive care needs of bladder cancer survivors across Canada

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Introduction and Objectives: Bladder cancer (BC) is the fifth most common malignancy in Canada. To date, very little research has examined the quality of life, informational, supportive care, and lifestyle needs of BC patients and survivors. Consequently, there is a dearth of resources available to meet the needs of BC patients and survivors. The objective of the current study was to assess and describe the supportive care and informational needs of people who have been diagnosed with bladder cancer.

Methods: A cross-sectional self-report survey assessing demographic and clinical variables, health behaviours, and information and supportive care needs was distributed to patients registered with Bladder Cancer Canada (BCC). Data collection occurred between March 2014 and January 2015 through fluidsurveys.com.

Results: A total of n=233 BC survivors completed the survey. Mean age was 63±9.4 years. 11% were currently undergoing or recently completed treatment for new BC diagnosis; 76% in post-treatment follow-up; 13% were receiving or recently completed treatment for recurrent disease. The most important informational needs identified were knowing the side-effects of treatment (94.8%) and how to prevent/manage them (93.6%). The average number of unmet supportive care needs was 5.6±7.6. This varied significantly across the cancer trajectory (p=0.013) with newly diagnosed participants reporting the most unmet needs (9.5±9.1) and patients in follow-up with the lowest (4.9±7.2). The mean number of unmet supportive care needs did not depend on the type of BC or gender. The most common unmet supportive care needs among all participants were having an ongoing case manager/contact person (31.1%), receiving help in making life decisions (27.1%), and managing others' expectations of them as a cancer survivor (24.7%).

Conclusion: This study provides important new information on the nature of the issues faced by BC survivors. This data can be used to improve the delivery comprehensive survivorship care through recommendations for resource and program development.

UP-08.03

Evaluation of preoperative functional autonomy factors for the prediction of complications post Radical Cystectomy

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Introduction and Objectives: Radical Cystectomy (RC) is known to carry a high risk of complications. Little data exists pertaining to modifiable pre-operative risk factors influencing the 90 day complication rate post-RC. The Functional Autonomy Measurement System (FAMS) was developed for the measurement of the needs of the elderly and the handicapped according to the WHO classification of disabilities. It has been studied and utilized in multiple fields including the evaluation and follow-up of patients undergoing surgery, rehabilitation, cognitive decline, etc. The objective of this pilot study was the identification of FAMS preoperative risk factors predictive of postoperative complications.

Methods: Pertinent pre-op evaluations were conducted (psychological, nutritional, social, physical, functional and medical) and postoperative complications (Clavien-Dindo and MSKCC classifications) recorded for 145 patients undergoing RC(Jan.2011-April2014). Logistic regressions were conducted for risk estimation of complications at 7, 30 and 90 days post-RC, according to the pre-op FAMS evaluation.

Results: 116 patients (80%) developed ≥1 complications in the 90 day post-op period (471 total complications). Mean hospitalization time was 17.9 days. A weak score on the FAMS Mental and Instrumental Activities of Daily Living (IADL) (scored 0-15 and 0-24, continuous variables) portions were associated with a high-risk of neurological complications at 7 (OR2.141; 95%CI 1.365–3.358, p=0.0009 and 1.162;1.026–1.315, p=0.0179), 30 and 90 days (equivalent scores: 2.122;1.375–3.279, p=0.0007 and 1.139;1.013–1.281, p=0.03).

Conclusions: Weak performance on the Mental and IADL portions of the FAMS pre-operative evaluation may predict an increased likelihood of neurological complications within 90 days post-RC. Preventive pre-op multidisciplinary interventions could potentially reduce the complication rate and impact of RC on patients' quality of life and merit further study.

UP-08.04

Treatment and outcomes of genitourinary small cell carcinoma in central Canada

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Introduction and Objectives: Genitourinary small cell carcinomas (SCC) are rare, aggressive malignancies with a poor prognosis. Due to the paucity of cases, treatment protocols used are extrapolated from small cell lung cancer and retrospective studies. Platinum based neoadjuvant-chemotherapy has been widely accepted as standard of care treatment, but there is controversy whether surgery or radiotherapy is superior for local control. The purpose of this study was to determine the treatment patterns and outcomes in central Canada.

Methods: Patients with a confirmed histological diagnosis of bladder and prostate SCC between 1996-2014 were identified from the Manitoba Cancer Registry. The Veterans Administration lung staging classification was used to classify patients in limited or extensive stage. The data collected included: demographics, initial stage, treatment and survival. Median survival was calculated by Kaplan Meier curves.

Results: Forty-two cases of primary genitourinary SCC were identified with 14 involving the prostate and 28 involving the bladder. Twelve of the 14 cases of prostate SCC were extensive, one was limited and one was not staged. Six patients with prostate SCC received no treatment (42.9%), 4 received only chemotherapy (28.6%), 1 received only radiotherapy (7.14%), 1 received only prostatectomy (7.1%), and 2 received chemo-radiation therapy (14.3%). The median survival for prostate SCC was 4.1 months (CI 2.1,11.1). Seventeen of the 28 cases of bladder SCC were staged as limited. Twenty-four cases affected males while only four cases were reported in females. Three patients with bladder cancer received no treatment (10.7%), 4 received only radiation therapy (14.3%), 1 received partial cystectomy and radiation therapy (3.6%), while 20 received chemo-radiation therapy (71.4%). The median survival for bladder SCC was 13.7 months (CI 9.3,55.1); 55.1 months with limited disease vs. 10.1 months with extensive disease (CI 8.2,121.1 and 1.0,14.0).

Conclusion: Genitourinary SCCs are aggressive malignancies with a high propensity to metastasize. Limited stage SCC bladder patients can have a surprisingly good outcome with multimodal treatment. The outcome for prostate SCC and extensive stage bladder SCC remains dismal.

UP-08.05

Long-term oncological and functional outcomes in radical cystectomy patients

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Introduction and Objectives: Bladder cancer is the second most common urological cancer in UK. Radical cystectomy with extended pelvic lymph node dissection is the gold standard for the muscle invasive bladder cancer and refractory high grade non muscle invasive bladder cancers. Despite radical treatment recurrences develop in nearly half of the patients (Madersbacher S, Hochreiter W et al, J Clin Oncol 2003 Feb 15;21(4):690-6). There is a lack of consensus on the radiological surveillance of patients post cystectomy. Some studies have demonstrated a better survival when recurrences are detected in asymptomatic patients while others have reported contrary results (Boorjian SA, Tollefson MK et al, J Urol 2011 Nov;186(5):1796-802) (Volkmer BG, Kuefer R et al, J Urol 2009 Apr;181(4):1587-93). We aimed to study the pattern of cancer recurrences, obstructive uropathy and renal function deterioration in post cystectomy patients**.**

Methods: Prospective data collection between January 2005 to September 2014. All patients underwent radical cystectomy with iliac lymph node dissection and urinary diversion (ileal conduit or in suitable patients an orthotopic bladder reconstruction). 6 week and then 6 monthly followup till 5 years, subsequent annual follow up. Clinical assesment, blood tests, CT Chest abdomen and pelvis at 6 monthly intervals till 5 years and annually thereafter. Cytology from urethral washout (ileal conduit patients) and urine cytology (orthotopic bladder patients) on annual basis to assess for urethral recurrence. Patients noted to have hydronephrosis had further assessment with MAG 3 renogram. Conduitograms in selected patients who developed obstructive uropathy.

Results: Our study population comprised of 204 patients of these 188 (88.3%) had an ileal diversion. There were 72.3% males and 27.7% females. The median age was 67 years (38 – 83) with a median follow up of 39 months (3 – 120). In the follow up period 77 (36.2%) patients died and 50 (23.5%) of these died due to bladder cancer recurrence. Overall survival at 5 and 10 years were 62.5% and 52.5%, respectively. Cancer specific survival at 5 and 10 years were 70% and 66%, respectively. In the long term, obstructive uropathy developed in 21 (9.8%) at a median time of 22 (1 – 88) months. Surgical management required in 71.4% of those with obstructive uropathy.

Conclusions: Radical cystectomy provides durable control for muscle invasive bladder cancer with a better quality of life. However, disease recurrences and complications in large number of patients that inevitably reduces the overall survival.

UP-08.06

Bi-polar plasma kinetic enucleation of non-muscle invasive bladder cancer: Initial experience with novel technique

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Introduction and Objective: Conventional Transurethral resection of bladder tumor (TURBT), using unipolar electroresection, is the gold standard procedure for staging and treatment of Non-muscle Invasive Bladder Cancer (NMIBC). However, it may be associated with dilutional hyponatremia, obturator nerve stimulation with subsequent bladder perforation, and high rate of recurrence. The aim of this study was to assess the efficacy and safety of a novel technique using bipolar plasma kinetic energy for en block enucleation of NMIBC.

Patients and Methods: Between February 2012 and June 2013, patients diagnosed with suspected NMIBC in a tertiary referral centre were prospectively recruited for a novel technique of transurethral Bi-polar Plasma Kinetic Enucleation of Bladder Tumour (PKEBT). Patients with tumour size >30 mm and those with >2 masses were excluded. The technique was performed using the Button loop and the HF Unit UES-40 Surgmaster (Olympus). Within 6 hours post-operatively, all patients received a single dose of intravesical Mitomycin-C through tri-way indwelling urethral catheter. One month postoperatively, repeat Bi-polar TURBT was performed for resection of any residual tumour. Furthermore, intravesical immunotherapy was introduced according to the pathology results. Follow-up diagnostic cystoscopy was performed at 3, 6, and 12 months. Baseline demographic characteristics and perioperative data were reported.

Results: A total of 46 patients underwent transurethral bipolar PKEBT. All procedures were successfully completed. Seventy eight percent of patients were male, with mean age of 62.7±8.5 years, mean tumour size of 17.8±6.1 mm, mean enucleation time of 17±5.4 minutes, mean operative time of 27.9±11.4 minutes and mean hospital stay of 35.4±13 hours. Three procedures were associated with intra-operative bleeding that necessitated blood transfusion. There were no other reported perioperative complications. One month post-operatively, 6 (13%) cases were diagnosed with residual tumour and had undergone Repeat Bi-polar TURBT. The overall recurrence rate at 12 months follow-up was 15.2%.

Conclusions: Bi-polar PKEBT seems to be safe and effective technique for management of NMIBC.

UP-08.07

Clinical and pathological prognostic factors for recurrence and progression for T1-high grade bladder cancer: A need for better prognostic markers

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Introduction and Objective: The management of T1 high grade urothelial cancer of the bladder is controversial because of its high rate of progression when treated conservatively. Clinical and pathological prognostic factors have been proposed to help aid in decision management. However, the importance of these factors is inconsistent in the literature. We aimed to validate traditional prognostic factors for recurrence and progression in our institutional practice.

Methods: We retrospectively identified 237 patients with T1 high grade urothelial cancer of the bladder who were treated conservatively at the University Health Network, Toronto from Jan 2002 to June 2013. Competing risk analysis was used to identify the 5-year risk of recurrence and progression. Univariate and multivariate regression analyses were used to determine the effect of clinical and pathological prognostic factors (age, gender, associated CIS, associated Lymphovascular invasion (LVI), primary vs. secondary tumor, use of BCG induction, and re-resection).

Results: The median age of the cohort was 71.4 years with a male: female ratio of 3.7:1 and a median follow up 3.9 years. CIS was present concomitantly in 28% of cases and LVI in 6.5%. The majority of the T1 high grade bladder cancer were primary (82%). Only 38% underwent re-resection. Of the 194 who received BCG induction, 111(57%) patients also received maintenance BCG with a median of 3 maintenance cycles. The cumulative incidence of recurrence and progression at 5 years were 64% and 21% ,respectively. For recurrence, the use of BCG induction was the only statistically significant variable in univariate analyses with a HR 0.62 (95% CI: 0.42-0.93). For progression, age was the only significant prognostic variable in univariate analyses HR 1.03(95% CI: 1.01-1.06). None of the variables included in our model were statistically significant in multivariate analysis for recurrence and progression.

Conclusion: Despite the potentially aggressive nature of T1HG bladder cancer, there exists a paucity of validated clinical markers of recurrence and progression. In our series, very few variables were statistically significantly associated with recurrence or progression. A need for robust predictors such as new biological markers is a priority.

UP-08.08

Urinary diversion: Does RARC learning curve affect diversion choice in urothelial carcinoma?

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Introduction and Objective: Contra-indications for continent diversions include abnormal glomerular filtration rate (GFR) and advanced age. The introduction of new techniques such as Robotic assisted radical cystectomy (RARC) however may introduce confounding selection and other biases into choice of diversion. This study examined if choice of diversion altered with the introduction of RARC.

Materials and Methods: IRB approved, retrospective chart review was performed on 383 non-metastatic patients who underwent definitive treatment with either ORC or RARC for urothelial carcinoma. Surgery was performed at a single tertiary care centre between 2001-2014 by a single, fellowship trained, urological oncologist.

Cohorts consisted of ORC (n=118, 1 cohort), and consecutive RARC (n=257) cohorts of 50 patients (Cohort 1: 1-50, Cohort 2: 51-100, etc). Eight patients underwent conversion from RARC to ORC during 2006-2014, these patients were excluded from analysis prior to construction of the cohorts.

Outcome was defined as continent (orthotopic ileal neobladder, or Indiana pouch) versus non-continent diversion, ie ileal conduit. Pre-op variables age, gender, obesity (BMI >30), GFR (<40, 40-60, >60 mL/min/1.73 m2), ASA status (1-2 vs. 3-4), clinical stage based on trans urethral resection of bladder tumor (TURBT), and previous pelvic radiation were examined on univariable analysis. Multivariable logistic regression analysis was performed using significant variables.

Results: On univariable analysis, younger age [OR 0.84; P<0.0001)], higher GFR [OR 2.4; P<0.0001)], and lower ASA [OR 0.29; P<0.0001)] were predictive of continent diversion. On multivariable logistic regression analysis, only age [OR 0.84; P<0.0001)] and GFR status: GFR 40-60 mL/min/1.73 m2: OR 3.35 (P=0.03); and GFR >60 mL/min/1.73 m2: OR 4.67 (P=0.004), were predictive of receiving continent diversion. ASA status and RARC cohort were not predictive of continent versus incontinent diversion on multivariable analysis.

Conclusions: The data suggests that while the introduction of new techniques such as RARC have altered the operation it has not altered the choice of optimal diversion for appropriate candidates and classic determinants such as age and renal function continue to drive this clinical decision.