Introduction: Patients with clinical T1 (cT1) urothelial bladder carcinoma (UBC) represent a clinical dilemma regarding the decision to proceed with cystectomy or conservative therapy as there is a significant risk of understaging, especially when no muscle is present on TURBT specimen. We review outcomes of patients with cT1 UBC who underwent radical cystectomy.

Methods: A retrospective review of 1964 patients undergoing radical cystectomy for bladder cancer at our institution from 1971-2008 revealed 442 patients with cT1 disease on last TURBT (excluding patients with any TURBT with clinical stage >T1 and patients receiving any neoadjuvant therapy). Further exclusion of patients without muscle present on last TURBT yielded 97 patients.

Results: Of the 442 patients with cT1 disease, 260 (58.8%) remained <pT1, 124 (28.1%) were upstaged to >pT2, and 58 (13.1%) had positive lymph node (LN+) at cystectomy; therefore, 182 (41.2%) had more extensive disease pathologically than documented clinically. There was no significant difference among patients with <pT1, >pT2, or LN+ regarding age (p=0.073), gender (p=0.869), prior BCG (p=0.427), number of TURBTs (p=0.141), multifocal disease (p=0.091), and associated CIS on TURBT or cystectomy (p=0.201 and p=0.114, respectively). LN+ patients were more likely than <pT1 or >pT2 to have LVI on TURBT (24.1% vs 11.5% vs 11.3%, p=0.029) and on cystectomy (67.2% vs 5.8% vs 36.3%, p<0.001). No clinical variables were associated with risk of upstaging to pT2 or LN+ disease on multivariate analysis (MVA). 5-yr recurrence-free survival (RFS) was 75.4% with MVA associating worse survival with >pT2 (HR=1.819, p=0.02), LN+ (HR=8.202, p<0.001), pathologic LVI (HR=2.022, p<0.001), multifocal disease (HR=1.306, p<0.001), and increasing number of TURBTs (HR=1.306, p<0.001). 5-yr overall survival (OS) was 68.4% with MVA associating worse survival with increasing age (HR=2.234, p<0.001), >pT2 (HR=1.557, p=0.0055), LN+ (HR=4.391, p<0.001), pathologic LVI (HR=1.641, p=0.002), and increasing number of TURBTs (HR=1.116, p=0.005). When limiting this cohort to just patients with muscle present on last TURBT (N=97), following cystectomy there were 65 (67%) remaining <pT1, 23 (23.7%) were still upstaged to >pT2, and 9 (9.3%) were lymph node positive; therefore, 31 (33%) had more extensive pathologic disease than thought clinically. The only significant difference among this group was a higher rate of pathologic LVI in patients with LN+ followed by >pT2, than <pT1 (77.8% vs 47.8% vs 6.2%, p<0.001). Their 5-yr RFS was 81.4% with MVA associating worse survival with LN+ (HR=9.111, p=0.007) and increasing number of TURBTs (HR=1.408, p=0.028). Their 5-yr OS was 73.5% with MVA associating worse survival with LN+ (HR=7.976, p=0.004).

Conclusion: Patients with cT1 have a significant rate of upstaging to muscle-invasive or LN+ disease at cystectomy, even when muscle is present at TURBT. Although the presence of LVI may be associated with more extensive disease favoring cystectomy over conservative management, there are no reliable clinical predictors available. Patients with cT1 disease need to be carefully counseled when considering conservative management with intravesical therapy.

Source of Funding: None
IS IT SAFE TO PERFORM CYSTECTOMY WITHIN 30 DAYS AFTER THE LAST DOSE OF NEOADJUVANT CHEMOTHERAPY?

Mark D. Tyson, M.D., Alan H. Bryce, M.D.,* Thai H. Ho, M.D.,
Ph.D.,* Erik P. Castle, M.D.: Phoenix, AZ
(Presentation to be made by Dr. Tyson)

Purpose: Few data exist on the optimal timing of cystectomy after neoadjuvant chemotherapy (NAC). This study evaluates the safety of performing a cystectomy within 30 days of the last dose of NAC.

Materials and Methods: The National Surgical Quality Improvement Program (NSQIP) database was used to acquire 1,394 cystectomies performed from January 1st, 2005 to December 31st, 2011. Of these, 122 patients underwent cystectomy within 30 days of the last dose of NAC. A propensity weighted comparative analysis of perioperative morbidity was performed.

Results: In unadjusted comparisons, patients undergoing cystectomy within 30 days of NAC were more likely to have peripheral nerve deficits (1.6% vs. 0.2%, \( P=0.01 \)), blood transfusions (37.7% vs. 27.5%, \( P=0.02 \)) and unplanned readmissions (11.5% vs. 6.6%, \( P=0.04 \)) but were less likely to require hospitalization greater than 8 days (45.1% vs. 58.8%, \( P=0.01 \)). After propensity-weighted adjustments, patients who underwent cystectomy within 30 days of surgery did not have any increased risk of perioperative surgical complications except for peripheral nerve deficits (3.2% vs. 0.3%, propensity score-adjusted odds ratio [PS-OR]: 13.1, 95% CI: 1.90-90.8, \( P=0.01 \)). In fact, rates of wound dehiscence (0.8% vs. 3.2%, PS-OR: 0.20, 95% CI: 0.04-0.89, \( P=0.04 \)) and sepsis (4.9% vs. 11.4%, PS-OR: 0.36, 95% CI: 0.17-0.76, \( P=0.01 \)) slightly favored the early cystectomy group. No differences in 30-day mortality were noted.

Conclusions: A retrospective review of the NSQIP database suggests that cystectomy can be safely performed within 30 days of NAC and may represent an efficient way to expedite definitive local therapy in appropriately selected patients.

Source of Funding: None
A STANDARDIZED PROTOCOL FOR IDENTIFYING AND COUNTING LYMPH NODES HARVESTED BY PELVIC LYMPH NODE DISSECTION AT THE TIME OF RADICAL CYSTECTOMY


(Presentation to be made by Dr. Metcalfe)

Purpose: A pelvic lymph node dissection (PLND) is considered to be an essential component of radical cystectomy for muscle invasive bladder cancer. Not only does it provide prognostic information, there is abundant data from numerous retrospective studies indicating that an extended PLND enhances survival. The number of lymph nodes counted by the pathologist in the PLND specimen has become a surrogate measure for the extent and therefore quality of lymph node dissection, but little consideration has been given to the technique by which lymph nodes are processed and counted. Here we report preliminary results from a prospective series comparing our conventional protocol for processing PLND specimens to a fat-emulsifying protocol. It was hypothesized that the fat-emulsifying protocol would reveal positive nodes in some patients whose specimens were found to contain no metastasis by standard processing.

Material and Methods: All PLND specimens were collected prospectively and sent for pathological analysis. Conventional processing involved palpation of the specimens (usually two “packets” per side) for individual nodes which were fixed, sectioned and counted on the slides. For the study protocol, the tissue discarded after removing palpated nodes was placed in a fat-emulsifying solution to identify further nodes visually. Nodal counts were compared between techniques, and the rate of node positivity was also compared.

Results: The PLND specimens from 23 patients were analyzed. Median number of nodes discovered using conventional method was 25 (10-59). An additional 5 nodes (median) were discovered per patient using the fat-emulsifying solution (0-19 nodes). Three patients had lymph node positive disease detected by conventional means. Positive nodal metastases were identified in 2/23 patients using the fat emulsifying solution. 1/23 patients had nodes discovered by the fat emulsifying protocol that did not have positive nodes detected by conventional means.

Conclusions: A fat emulsifying protocol may be an appropriate method to standardize lymph node processing following PLND and may enable more accurate comparison of lymph node counts between institutions. Furthermore, our preliminary data indicate that this method may lead to more accurate staging of the lymph nodes, which could have ramifications for adjuvant therapy.

Source of Funding: Canadian Urology Oncology Group (CUOG) and Bladder Cancer Canada
CLINICAL NODE POSITIVE BLADDER CANCER: ACTUAL PATHOLOGIC NODAL INVOLVEMENT AND PATIENT OUTCOMES

Mehrdad Alemozaffar, M.D., Sameer Chopra, M.D., Jie Cai, Gus Miranda, Tanya Dorff, M.D., David Quinn, M.D., Anne Schuckman, M.D., Siamak Daneshmand, M.D.: Los Angeles, CA
(Presentation to be made by Dr. Alemozaffar)

Introduction: Patients with urothelial carcinoma who have clinical node positive (cN+) disease are felt to have a poor prognosis. However, they may have a significant response to neoadjuvant chemotherapy or may have node negative disease following radical cystectomy (RC). We review our experience with cN+ bladder cancer patients undergoing RC.

Methods: A retrospective review of 1964 patients who underwent RC for bladder cancer from 1971 to 2008 identified 44 patients with cTxN+M0 disease on pre-operative imaging. Clinical, pathologic and oncologic outcomes were evaluated.

Results: Neoadjuvant chemotherapy was administered to 19 (43.1%) and pathologic nodal stage was negative (ypN0) in 9 (47.4%) and positive (ypN+) in 10 (52.6%). Of the 25 (56.8%) patients not receiving neoadjuvant chemotherapy pathologic nodal stage was negative (pN0) in 3 (12%) and positive (pN+) in 22 (88%). Overall, 32 (72.7%) had pathologically positive lymph nodes while 12 (27.3%) were negative. Patients with pathologically positive lymph nodes were more likely to have pathologic extravesical extension of disease (75% vs 41.7%, p=0.038), multifocal disease on cystectomy (40.6% vs 8.3%, p=0.041), and lymphovascular invasion on cystectomy (65.6% vs 8.3%, p=<0.001). Of the 32 patients with positive pathologic lymph nodes, the median number of positive nodes was 9.5, lymph node density was 12.5%, and level of lymph node involvement was level 1 in 28%, level 2 in 12%, and level 3 in 60%. As seen in table 1, overall, median recurrence-free survival (RFS) was 2.5 years and median OS was 3 years. Of patients receiving neoadjuvant chemotherapy, 5-yr RFS survival was 55.6 % in ypN0 and 10% in ypN+, and 5-yr OS was 66.7% in ypN0 and 10% in ypN+. Although there appears to be a trend towards improved survival in patients with ypN0 vs ypN+, sample numbers were too small for appropriate statistical analysis.

Conclusions: Patients with cN+ bladder cancer can still achieve meaningful RFS and OS following RC, with or without neoadjuvant chemotherapy. Although some patients have no pathologic lymph node disease found after cystectomy, it is not possible to know if this is a result of neoadjuvant chemotherapy or initial misidentification of cN+ disease. Regardless, RC with thorough lymph node dissection, with or without neoadjuvant chemotherapy, remains a viable treatment option in patients with cN+ bladder cancer.

Source of Funding: None

Table 1. Recurrence-Free Survival (RFS) and Overall Survival (OS)

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<td></td>
<td>RFS</td>
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<td>ypN+ (n=22)</td>
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<tr>
<td>pN0</td>
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<tr>
<td>Median</td>
<td>2.5 yrs</td>
<td>2.7 yrs</td>
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<tr>
<td>OS</td>
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<td>51.4%</td>
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<td>5 yr</td>
<td>3 yrs</td>
<td>1.2 yrs</td>
<td>3.8 yrs</td>
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<td>Median</td>
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Purpose: To evaluate a peri-operative protocol to expedite recovery of bowel function and decrease length of stay (LOS) without increasing readmission and complication rates after radical cystectomy and urinary diversion for bladder cancer.

Material and Method: From May 2012 to May 2013, a peri-operative protocol was applied to 100 unselected consecutive patients who underwent open radical cystectomy and urinary diversion for bladder cancer with prospective follow-up. The protocol focuses on avoiding bowel preparation and nasogastric tube, early feeding, minimizing narcotics for pain, and the use of a μ-opioid antagonist. Patients with any adjunct surgery (11) or prolonged intubation postoperatively (4) were excluded. Time to bowel movement (BM) and regular diet, LOS, and 30-day readmission and complication rates were captured. The outcomes of interest were compared to a historical cohort.

Result: A total of 85 (68 male) patients were included. Median age was 68 y/o (range, 30-90). 30 (35%) patients were ≥ 75 y/o and 64 (75%) patients underwent continent urinary diversion. 68 (80%) patients had BM and 65 (76%) patients were advanced to regular diet by postoperative day (POD) 2. Median LOS was 4 days and 65 (77%) patients were discharged home by POD 5. Only two patients had postoperative ileus and NGT placement during postoperative hospitalization. The most common 30-day complications were urinary tract infection and dehydration which were also most common etiologies for readmission. Major complications (≥ Clavien grade III) were seen in 13(15%) patients and were significantly higher in patients ≥75 y/o compared to their younger counterparts (26% vs. 9%; P=0.03). There was no difference in other measured outcomes with respect to age (≥75 vs. <75 y/o) and type of urinary diversion (continent vs. incontinent).

Conclusion: Our current ERAS protocol resulted in significant reduction in time to BM and LOS without increasing early readmission and complication rates.

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<td>Median estimated blood loss, ml</td>
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<td>1000</td>
<td>&lt;0.001</td>
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<td>Median time to bowel movement, (days)</td>
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<td>-</td>
<td></td>
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<tr>
<td>Median time to regular diet, (days)</td>
<td>2</td>
<td>-</td>
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<tr>
<td>30-day mortality rate n (%)</td>
<td>1 (0.01)</td>
<td>-</td>
<td></td>
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<tr>
<td>30-day readmission rate n (%)</td>
<td>19 (22)</td>
<td>107 (22)</td>
<td>0.9</td>
</tr>
<tr>
<td>30-day complication rate n (%)</td>
<td>49 (57)</td>
<td>277 (65)</td>
<td>0.1</td>
</tr>
<tr>
<td>Minor (Clavien grade 1 – 2)</td>
<td>49 (57)</td>
<td>212 (50)</td>
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<tr>
<td>Major (Clavien grade 3 – 5)</td>
<td>13 (15)</td>
<td>65 (15)</td>
<td>0.9</td>
</tr>
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Source of Funding: None
GASTROINTESTINAL RECOVERY USING PERIOPERATIVE ALVIMOPAN WITH ROBOTIC CYSTECTOMY AND URINARY DIVERSION

(Presentation to be made by Ross Anderson, B.S. *)

Purpose: Postoperative ileus contributes significantly to the morbidity associated with radical cystectomy and urinary diversion. Alvimopan, a peripheral acting µ-opioid receptor antagonist, has been shown to accelerate gastrointestinal recovery following bowel resection. Robotic cystectomy may also shorten postoperative ileus compared to open cystectomy. We investigate gastrointestinal recovery and length of hospital stay (LOS) using perioperative alvimopan with particular attention to whether there is added benefit to this drug in patients undergoing robotic cystectomy and urinary diversion.

Materials and Methods: Over a two year period (2011-2013), a total of 53 patients with bladder cancer underwent robotic cystectomy with urinary diversion. Of this group, 37 did not receive perioperative alvimopan while 16 more recently treated patient got alvimopan starting preoperatively and continued postoperatively as directed. Return of bowel function, defined by time to first flatus and time to bowel movement (BM), was compared between these groups. Hospital LOS and gastrointestinal complications were also evaluated.

Results: There was no difference between alvimopan-treated or untreated groups with regard to gender distribution, age, BMI, bladder cancer pathologic stage or urinary diversion option. Time to first flatus (2.5 versus 3.6 days, p=0.004) and bowel movement (3.5 versus 4.7 days, p=0.018) were significantly shorter in those patients who received alvimopan. In addition, hospital LOS (4.2 versus 7.5 days, p=0.015) was significantly reduced in the alvimopan cohort. There were no patients with prolonged ileus in the alvimopan group and no difference between the groups in hospital readmission rates or gastrointestinal complications.

Conclusions: In our experience, perioperative use of alvimopan significantly accelerates gastrointestinal recovery and hospital discharge, even in patients undergoing robotic cystectomy which itself is associated with a shorter hospital stay than open cystectomy at our institution. The combination of a robotic approach and perioperative alvimopan may result in the shortest possible time to bowel recovery and hospital discharge, reducing cost and limiting perioperative complications.

Source of Funding: None
VENOTHROMBOEMBOLISM AND RADICAL CYSTECTOMY: PREVALENCE OF RISK FACTORS AND COMPARISON OF ANTICOAGULATION USE
Andrew J. Sun* B.S., Hooman Djaladat, M.D., Anne K. Schuckman, M.D., Gus Miranda*, Siamak Daneshmand, M.D.: Los Angeles, CA  
(Presentation to be made by Andrew Sun, B.S.)

Purpose: Radical cystectomy is a major pelvic operation associated with relatively high rates of venothromboembolism (VTE). This study focused on the prevalence of known risk factors in patients undergoing radical cystectomy who suffered a symptomatic VTE and compared use of warfarin and heparin in prophylaxis.

Methods: We conducted a retrospective review of 2730 patients who underwent open radical cystectomy at USC between 1971-2012 using the IRB approved bladder cancer database. Patient who suffered a VTE during the peri-operative period were identified. Pre-operative, operative, and post-operative risk factors for VTE were analyzed for prevalence. Data on use of anticoagulation was obtained and used to compare a historical cohort of warfarin use as prophylaxis (1971-2007) to the modern cohort of subcutaneous heparin use (2009-2012). A Chi-squared test was used to determine significance of any differences in prophylaxis use.

Results: A total of 129 patients (4.7%) with symptomatic VTE were identified. From these, 112 (86.8%) fit intent to cure inclusion criteria and were further evaluated for demographic information (85% male, median age 69.9, median BMI 27.9, and smoking history in 61.6%) and risk factors. Of pre-operative risk factors for VTE, previous systemic chemotherapy (9.8%) and other active medical illness (17.4%, e.g. atrial fibrillation, hypothyroidism, congestive heart failure) were most common. Median operative time was 363 minutes, median EBL was 800 ml, and a median 2.0 units of intra-operative PRBCs was transfused. The median day of first ambulation was POD 3, median LOS was 11 days, and a median interval between surgery and VTE diagnosis was 20.5 days. 15.1% of VTE patients also had a post-op infection. Of the 129 total VTE cases, the overall rate from 1971-2007 (treated with warfarin) was 4.1%, while the rate from 2009-2012 (treated with heparin) was 6.3% (p=0.054). Percent of patients with a VTE occurring after discharge from 1971-2007 and 2009-2012 were 2.3% and 4.1%, respectively (p=0.052).

Conclusions: Most VTEs (60%) occur after discharge, indicating a possible need for VTE prophylaxis beyond the immediate post-op period. There was a trend toward reduced risk of VTE with post-operative use of warfarin compared to heparin. Use of warfarin may have provided a more prolonged anticoagulation effect.

Source of Funding: None
EFFECTS OF NERVE SPARING ROBOTIC ASSISTED LAPAROSCOPIC CYSTOPROSTATECTOMY ON ERECTILE FUNCTION IN A PRE-OPERATIVELY POTENT POPULATION.

Ken Haberman, M.D., Bertram Yuh, M.D., Nora Ruel, M.S., Clayton Lau, M.D., Timothy Wilson, M.D., Kevin Chan, M.D.: Duarte, CA
(Presentation to be made by Dr. Haberman)

Purpose: Post-operative erectile function is an important quality of life issue for those younger patients with good erections requiring radical cystectomy for bladder cancer. During open surgery, a cavernosal nerve sparing approach has been shown to be beneficial in maintaining potency in this population. No studies have evaluated the effects on potency with robot assisted radical cystectomy (RARC) in this pre-operatively potent population. We review our experience and outcomes with this procedure.

Materials and Methods: We retrospectively reviewed all patients who underwent RARC between 2003 and 2012 at our single institution. We identified for inclusion in this study, 33 male patients who were under 65 years old and had evidence of pre-op erections on chart review. Due to advanced disease or prior surgery, 4 patients did not have a nerve sparing approach. The remaining 29 patients underwent a bilateral nerve sparing procedure. 28 (97%) had a concomitant creation of a continent urinary diversion (Studer neobladder or Indiana pouch).

Results: With a median follow up of 32.9 months, 13 (45%) patients have documented erections sufficient for penetration either on their own or with use of PDE5 inhibitors. Overall our cohort was representative of a wide range of bladder cancer with 38% having pathologic T2 or greater disease. There was no local recurrence, no positive bladder margins, and 13.8% rate of distant recurrence, with no significant difference in these factors for those with and without good post-operative potency. In fact, using univariate analysis, there was no significant difference between those who recovered erections and those who did not on a wide range of demographic, operative, and peri-operative factors including age, co-morbidities, operative time or pathologic stage.

Conclusion: A cavernosal nerve-sparing RARC allows for similar recovery of potency as seen in open series. Furthermore, even with higher risk disease, there is no loss in cancer control rates compared to historical open or laparoscopic series. Further studies are required to help elucidate why some men have better recovery in this setting than others.

Source of Funding: None
SURVEILLANCE GUIDELINES FOR UPPER TRACT UROTHELIAL CARCINOMA
BASED ON RECURRENCE PATTERNS

Reza Hamidizadeh, M.D., Wassim Kassouf, M.D., FRCSC, Ricardo Rendon, M.D.,
FRCSC, David Bell, M.D., FRCSC, Jonathan Izawa, M.D., FRCSC, Joseph Chin, M.D.,
FRCSC, Anil Kapoor, M.D., FRCSC, Edward Matsumoto, M.D., FRCSC, Jean-Baptiste
Lattouf, M.D., FRCSC, Fred Saad, M.D., FRCSC, Louis Lacombe, M.D., FRCSC, Yves
Fradet, M.D., FRCSC, Adrian Fairey, M.D., FRCSC, Niels-Erik Jacobson, M.D., FRCSC,
Darrel Drachenberg, M.D., FRCSC, Ilias Cagiannos, M.D., FRCSC, Alan So, M.D.,
FRCSC, Peter Black, M.D., FRCSC: Vancouver, BC
(Presentation to be made by Dr. Hamidizadeh)

Objectives: Upper tract urothelial carcinoma (UTUC) accounts for 5% of all urothelial
carcinomas and due to its relative rarity, evidence-based surveillance guidelines and
clinicopathologic determinants of recurrence are lacking. We aim to develop a post-
nephroureterectomy, risk-based surveillance protocol based on recurrence patterns in a
large cohort of patients with UTUC.

Methods: 1113 patients having undergone nephroureterectomy for UTUC across 10
Canadian academic institutions were retrospectively reviewed. A multivariable analysis
model identified clinicopathologic characteristics, which were then used to devise risk
categories. Based on recurrence patterns in each risk category, a risk-based surveillance
protocol for local and metastatic recurrence was suggested.

Results: Overall, 288 (26%) patients had urothelial recurrence (bladder, contralateral
upper tract) and 266 (24%) developed metastases (nephrectomy bed, distant). Age (HR
1.02), female gender (HR 1.48), tumor multifocality (HR 1.93), positive surgical margins (HR
1.62), and presence of lymphovascular invasion (LVI) (HR 1.81) were associated with
urothelial recurrence. Significant predictors of metastatic recurrence included female
gender (HR 2.08), T2+ tumors (HR 2.71), N+ status (HR 3.11), tumor multifocality (HR
1.63), WHO Grade 3 tumors (HR 1.79), and presence of LVI (HR 1.62). Low-risk patients
include those with Ta-T1 tumors and no other adverse pathologic features. The presence of
any one adverse pathologic feature (LVI, WHO grade 3, multifocality) confers intermediate
risk. High-risk patients have >T2 or N+ disease.

Overall, the most common sites for metastatic recurrence were lung (28%), liver (23%), and
bone (20%). Only 13% of urothelial recurrences occurred in the contralateral upper tract. In
the first 9 months the number of intravesical recurrences amongst high (23%) and
intermediate (20%) risk patients was comparable. Thereafter, high-risk patients presented
with the majority of bladder recurrences (30% vs. 19% combined low and intermediate-
risk). 29% of contralateral upper tract recurrences occurred in high risk patients in the first 6
months post therapy. The majority (66%) of lung metastases were seen in high-risk
patients and occurred early (40% within 12 months). Abdominal metastases (nephrectomy
bed, liver, nodal) are most common in high-risk patients (80%) and 83% occur in the first 24
months.

Conclusions: Based on the above recurrence patterns, the following surveillance
guidelines are recommended.

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<td>Intermediate risk (Ta-T1 AND LVI or WHO grade 3 or multifocality)</td>
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Source of Funding: None
REGIONAL SMOKING BEHAVIORS ARE ASSOCIATED WITH BLADDER CANCER RISK: A STUDY FROM THE OREGON STATE CANCER REGISTRY

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(Presentation to be made by Ross Anderson)

Background and Objective: Bladder cancer (BC) is a smoking related cancer, and greater than 50% of BC patients have a smoking history. Data from the Behavioral Risk Factor Surveillance System (BRFSS) demonstrates that the proportion of adults that smoke in Oregon varies widely by county, from 8-30%. We sought to determine the association between smoking rates and bladder cancer incidence using the Oregon State Cancer Registry (OSCaR).

Methods: We used the BRFSS age-adjusted smoking data from 2003 to 2009 to identify county level smoking rates. We then used the OSCaR to identify county level BC diagnosis rates from 1996 to 2011. Counties were stratified into three risk groups based on the percent of adults that smoke compared to the Oregon state average: above average, average, and below average. Relative risks of bladder cancer in each risk group were calculated. Differences in gender and age between county subgroups were calculated using chi-square and independent T-tests, respectively.

Results: During the study period there were 13,787 total cases of BC identified. The average smoking rate in the state of Oregon is 17%. Eight counties, which comprised 17% of the population, had increased smoking rates (mean=25.5%) when compared to the state average. Three counties had decreased smoking rate (mean=10.7%) compared to the state average (17%). There was no significant difference in county subgroup's gender or age distributions. See Table One for Relative Risks.

Table 1: County smoking rates and relative risk for bladder cancer

<table>
<thead>
<tr>
<th>County Smoking Subgroup</th>
<th># BC cases</th>
<th>Relative Risk (95%CI)</th>
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</thead>
<tbody>
<tr>
<td>Above Average</td>
<td>3241</td>
<td>1.61 (1.55-1.67)</td>
</tr>
<tr>
<td>Average</td>
<td>9029</td>
<td>0.98 (0.94-1.01)</td>
</tr>
<tr>
<td>Below Average</td>
<td>1517</td>
<td>0.66 (0.62-0.69)</td>
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</table>

Conclusions: Living in counties with increased smoking is associated with an increased risk of bladder cancer. By using the BRFSS tobacco data, populations at risk for bladder cancer can be identified and potentially targeted for smoking cessation and bladder cancer awareness.

Source of Funding: This project was made possible by the Oregon Health and Science University Knight Cancer Institute pilot project fund.
TREATMENT TRENDS IN STAGE I SEMINOMA IN THE US: 2000-2010
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Christopher Porter, M.D.: Seattle, WA
(Presentation to be made by Claudio Jeldres)

Purpose: In high volume centers in North America and Europe, active surveillance (AS) has become the preferred approach in Stage I Seminoma disease. The national guidelines of Europe and Canada reflect this, however penetration of AS into US clinical practice is largely unknown. Many US clinicians choose to continue to apply traditional modalities, such as adjuvant radiotherapy. To our knowledge, there are no studies published in the last 10 years that focus on patterns of treatment. We used a large population-based database to assess the patterns of care in the US over a 10-year period.

Materials and Methods: Within the National Cancer Data Base, we retrospectively identified 27,486 patients diagnosed with Stage I seminoma after radical orchiectomy, from 2000 through 2010. The objective of this study was to identify patterns of care and trends in the use of different therapeutic modalities in testis cancer during the last decade in the US, namely, use of radiotherapy, adjuvant chemotherapy or AS for Stage 1 seminoma germ cell tumors. Statistical analysis relied on Chi-square, \( \chi^2 \) trend tests and cross-tabulation.

Results: Between 2000 and 2010, a total of 43,080 stage I testicular germ cell tumors were diagnosed, and of those 27,486 (63.8%) were seminoma. The incidence rate varied between from 2301 to 2736 cases/year. A significant trend toward fewer cases/year in the recent years was identified (trend p-value <0.001). Rates of primary treatment modalities also varied through the decade. Radiotherapy use dropped form 69.9% in 2000 to 36% in 2010 (trend p-value <0.001). Conversely, active surveillance and chemotherapy increased from 27.8% to 45.9% and 2.3% to 18.1%, respectively, during the same period (trend p-value <0.001). It was only in 2009 that AS finally became the most used first line treatment option in the US.

Conclusions: Seminoma is the most common histology type for stage I testicular germ cell tumors. Patterns of care for stage I seminoma have continuously changed during the past decade with the use of active surveillance becoming the main modality of choice since 2009.

Source of Funding: None