Additional Evidence Synthesis
Appendix 1

Knowledge & Library Services: Search results

Search question:

Is bladder cystectomy using robotic assisted surgery effective?

Terms used:

Patient/Population/Problem	Intervention	Comparison	Outcome
Urinary Bladder Neoplasms/ “bladder cancer” Cystectomy/	Robotic Surgical Procedures/ Robotics/ “da vinci”	"open cystectomy" Laparoscopy/	

The complete search strategy is in the Appendix.

The PICO for the searches run in 2014 are:

Search date June 2014.

Inclusion criteria for identification of relevant studies

Patients/Population	Intervention	Comparator	Outcomes	Study types
Adults (18 years or over) with bladder cancer	Robot-assisted cystectomy with or without extra/intra corporeal urinary diversion (including search terms ‘robotics’ and ‘da Vinci;)	Open cystectomy with or without extra/intra corporeal urinary diversion Laparoscopic cystectomy with or without extra/intra corporeal urinary diversion	Clinical effectiveness Adverse events/complications Mortality Quality of life (including patient self-reported outcome measures) Occupational-related outcomes Length of stay Re-admissions Cost/cost-effectiveness Any	Meta-analyses Systematic reviews Randomised controlled trials Prospective non-randomised clinical study Other clinical study Health economics studies

Limits applied:

Age group	Language	Publication type	Time limit
			From July 2014

Disclaimer

Although every effort has been made to ensure this information is accurate, it is possible it may not be representative of the whole body of evidence available. Both articles and internet resources may contain errors or out of date information. None of the resources have been critically appraised. No responsibility can be accepted for any action taken on the basis of this information.

Summary of resources searched and results:

Source	Results
NHS EVIDENCE	3
COCHRANE LIBRARY	1
SOCIAL POLICY AND PRACTICE	Not searched
GLOBAL HEALTH	Not searched
MEDLINE	12
EMBASE	23
CINAHL	Not searched
CAMPBELL COLLABORATION	Not searched
SOCIAL CARE ONLINE	Not searched
BRITISH NURSING INDEX	Not searched
PSYCINFO	Not searched
AMED	Not searched
HMIC	Not searched
HEALTH BUSINESS ELITE	Not searched
OPENSIGLE	Not searched
OTHER (SPECIFY) NICE EVIDENCE SEARCH	1

Obtaining full text: For help with getting the full text of these articles, please contact the PHE Knowledge & Library Services (libraries@phe.gov.uk)

Contents

Policy documents

None found

Guidelines

NICE. Bladder cancer. 2015. Available from: http://www.nice.org.uk/guidance/ng2/history and http://www.nice.org.uk/news/press-and-media/new-nice-guideline-to-ensure-people-with-bladder-cancer-receive-the-same-level-of-treatment-and-support-wherever-they-live

British Association of Urological Surgeons (BAUS). Robotic surgery curriculum: guidelines for training. 2015. Available at:

http://www.baus.org.uk/_userfiles/pages/files/Publications/Robotic%20Surgery%20Curriculum.pdf

European Association of Urology. Guidelines on
Muscle-invasive and metastatic bladder cancer. Available from:
http://uroweb.org/wp-content/uploads/EAU-Guidelines-Muscle-invasive-and-Metastatic-Bladder-Cancer-2015-v1.pdf

Cochrane library - systematic reviews

None found

Evidence summaries

None found

Literature reviews

Title: Totally intracorporeal robot-assisted radical cystectomy: optimizing total outcomes.
Citation: BJU international, Sep 2014, vol. 114, no. 3, p. 326-333 (September 2014)
Author(s): Collins, Justin W, Wiklund, N Peter
Abstract: We performed a systematic literature review to assess the current status of a totally intracorporeal robot-assisted radical cystectomy (RARC) approach. The current 'gold standard' for radical cystectomy remains open radical cystectomy. RARC has lagged behind robot-assisted prostatectomy in terms of adoption and perceived patient benefit, but there are indications that this is now changing. There have been several recently published large series of RARC, both with extracorporeal and with intracorporeal urinary diversions. The present review focuses on the totally intracorporeal approach. Radical cystectomy is complex surgery with several important outcome measures, including oncological and functional outcomes, complication rates, patient recovery and cost implications. We aim to answer the question of whether there are advantages to a totally intracorporeal robotic approach or whether we are simply making an already complex procedure more challenging with an associated increase in complication rates. We review the current status of both oncological and functional outcomes of totally intracorporeal RARC compared with standard RARC with extraperitoneal urinary diversion and with open radical cystectomy, and assess the associated short- and long-term complication rates. We also review aspects in training and research that have affected the uptake of RARC. Additionally we evaluate how current technology is contributing to the future development of this surgical technique.
Source: Medline

Systematic reviews

Title: Comparing robotic, laparoscopic and open cystectomy: a systematic review and meta-analysis.

Citation: Archivio italiano di urologia, andrologia : organo ufficiale [di] Società italiana di ecografia urologica e nefrologica / Associazione ricerche in urologia, Mar 2015, vol. 87, no. 1, p. 41-48, 1124-3562 (March 2015)
Author(s): Fonseka, Thomas, Ahmed, Kamran, Froghi, Saied, Khan, Shahid A, Dasgupta, Prokar, Shamim Khan, Mohammad
Abstract: To conduct a systematic review and meta-analysis comparing outcomes between Open Radical Cystectomy (ORC), Laparoscopic Radical Cystectomy (LRC) and Robot-assisted Radical Cystectomy (RARC). RARC is to be compared to LRC and ORC and LRC compared to ORC. A systematic review of the literature was conducted, collating studies comparing RARC, LRC and ORC. Surgical and oncological outcome data were extracted and a meta-analysis was performed. Twenty-four studies were selected with total of 2,104 cases analyzed. RARC had a longer operative time (OPT) compared to LRC with no statistical difference between length of stay (LOS) and estimated blood loss (EBL). RARC had a significantly shorter LOS, reduced EBL, lower complication rate and longer OPT compared to ORC. There were no significant differences regarding lymph node yield (LNY) and positive surgical margins (PSM.) LRC had a reduced EBL, shorter LOS and increased OPT compared to ORC. There was no significant difference regarding LNY. RARC is comparable to LRC with better surgical results than ORC. LRC has better surgical outcomes than ORC. With the unique technological features of the robotic surgical system and increasing trend of intra-corporeal reconstruction it is likely that RARC will become the surgical option of choice.
Source: Medline

Title: Robotic or open radical cystectomy, which is safer? A systematic review and meta-analysis of comparative studies.

Citation: Journal of endourology / Endourological Society, Oct 2014, vol. 28, no. 10, p. 1215-1223 (October 2014)
Author(s): Ishii, Hiro, Rai, Bhavan Prasad, Stolzenburg, Jens-Uwe, Bose, Pradeep, Chlosta, Piotr L, Somani, Bhaskar K, Nabi, Ghulam, Qazi, Hasan Abdur Rahman, Rajbabu, Krishnamoorthy, Kynaston, Howard, Aboumarzouk, Omar M
Abstract: Robotic radical cystectomy (RRC) has been growing in popularity across the world as a treatment option for bladder cancer. To compare early surgical outcomes for RRC and open radical cystectomy (ORC) with an emphasis on complications and postoperative mortality rates. A literature review was conducted from 2000 to 2013, including studies comparing RRC and ORC. The main outcome measures analyzed were the complications and mortality rates, in addition to patient demographics, pathological parameters, operating time, estimated blood loss (EBL),

transfusion rates, and type of urinary diversion. A meta-analysis was conducted. For continuous data, the Mantel-Haenszel chi-square test was used, and for dichotomous data, inverse variance was used and each expressed as risk ratio with 95% CI. In total, 748 patients were included, 461 patients in the robotic group and 287 patients in the open group (seven studies). There were no significant differences in the demographic parameters of the two groups, except for age (age: p=0.03). There was no difference in the number of muscle-invasive diseases: p=0.47. No difference in positive surgical margin rates (p=0.21). The overall (p=0.32) and lower grade (Clavien I-II) (p=0.10) complication rates between the two cohorts did not achieve statistical significance. The high-grade (Clavien III-IV) (p=0.007) complication rates in the ORC group were significantly higher. The mortality rate (Clavien V) was higher in the ORC group (2.2%) compared with the RRC group (0.35%) and this did achieve statistical significance on a meta-analysis (p=0.04). The EBL and transfusion rates were statistically significantly lower in the RRC cohort (p<0.00001). The operating time was statistically significantly higher in the RRC cohort (p<0.00001). There was no statistically significant difference in the margin positivity between the two cohorts (p=0.08). In early experience, RRC appears to be feasible and a safe alternative to the ORC. RRC appears to have lower high-grade complications and mortality rates compared with the open approach. Although these results are promising, the authors would suggest caution while interpreting these results due to concerns with methodological flaws in the included studies in this review.
Source: Medline

Title: Systematic review and cumulative analysis of oncologic and functional outcomes after robot-assisted radical cystectomy
Citation: European Urology, March 2015, vol./is. 67/3(402-422), 0302-2838;1873-7560 (01 Mar 2015)
Author(s): Yuh B., Wilson T., Bochner B., Chan K., Palou J., Stenzl A., Montorsi F., Thalmann G., Guru K., Catto J.W.F., Wiklund P.N., Novara G.
Language: English
Abstract: Context Although open radical cystectomy (ORC) is still the standard approach, laparoscopic radical cystectomy (LRC) and robot-assisted radical cystectomy (RARC) are increasingly performed. Objective To report on a systematic literature review and cumulative analysis of pathologic, oncologic, and functional outcomes of RARC in comparison with ORC and LRC. Evidence acquisition Medline, Scopus, and Web of Science databases were searched using a free-text protocol including the terms robot-assisted radical cystectomy or da Vinci radical cystectomy or robot* radical cystectomy. RARC case series and studies comparing RARC with either ORC or LRC were collected. A cumulative analysis was conducted. Evidence synthesis The searches retrieved 105 papers, 87 of which reported on pathologic, oncologic, or functional outcomes. Most series were retrospective and had small case numbers, short follow-up, and potential patient selection bias. The lymph node yield during lymph node dissection was 19 (range: 3-55), with half of the series following an extended template (yield range: 11-55). The lymph node-positive rate was 22%. The performance of lymphadenectomy was correlated with surgeon and

institutional volume. Cumulative analyses showed no significant difference in lymph node yield between RARC and ORC. Positive surgical margin (PSM) rates were 5.6% (1-1.5% in pT2 disease and 0-25% in pT3 and higher disease). PSM rates did not appear to decrease with sequential case numbers. Cumulative analyses showed no significant difference in rates of surgical margins between RARC and ORC or RARC and LRC. Neoadjuvant chemotherapy use ranged from 0% to 31%, with adjuvant chemotherapy used in 4-29% of patients. Only six series reported a mean follow-up of >36 mo. Three-year disease-free survival (DFS), cancer-specific survival (CSS), and overall survival (OS) rates were 67-76%, 68-83%, and 61-80%, respectively. The 5-yr DFS, CSS, and OS rates were 53-74%, 66-80%, and 39-66%, respectively. Similar to ORC, disease of higher pathologic stage or evidence of lymph node involvement was associated with worse survival. Very limited data were available with respect to functional outcomes. The 12-mo continence rates with continent diversion were 83-100% in men for daytime continence and 66-76% for nighttime continence. In one series, potency was recovered in 63% of patients who were evaluable at 12 mo. Conclusions Oncologic and functional data from RARC remain immature, and longer-term prospective studies are needed. Cumulative analyses demonstrated that lymph node yields and PSM rates were similar between RARC and ORC. Conclusive long-term survival outcomes for RARC were limited, although oncologic outcomes up to 5 yr were similar to those reported for ORC. Patient summary Although open radical cystectomy (RC) is still regarded as the standard treatment for muscle-invasive bladder cancer, laparoscopic and robot-assisted RCs are becoming more popular. Templates of lymph node dissection, lymph node yields, and positive surgical margin rates are acceptable with robot-assisted RC. Although definitive comparisons with open RC with respect to oncologic or functional outcomes are lacking, early results appear comparable.
Publication Type: Journal: Conference Paper
Source: EMBASE

Title: Systematic review and cumulative analysis of perioperative outcomes and complications after robot-assisted radical cystectomy
Citation: European Urology, March 2015, vol./is. 67/3(376-401), 0302-2838;1873-7560 (01 Mar 2015)
Author(s): Novara G., Catto J.W.F., Wilson T., Annerstedt M., Chan K., Murphy D.G., Motttrie A., Peabody J.O., Skinner E.C., Wiklund P.N., Guru K.A., Yuh B.
Language: English
Abstract: Context Although open radical cystectomy (ORC) is still the standard approach, laparoscopic radical cystectomy (LRC) and robot-assisted radical cystectomy (RARC) have gained popularity. Objective To report a systematic literature review and cumulative analysis of perioperative outcomes and complications of RARC in comparison with ORC and LRC. Evidence acquisition Medline, Scopus, and Web of Science databases were searched using a free-text protocol including the terms robot-assisted radical cystectomy or da Vinci radical cystectomy or robot* radical cystectomy. RARC case series and studies comparing RARC with either ORC or LRC were collected. Cumulative analysis was conducted.

Evidence synthesis The searches retrieved 105 papers. According to the different diversion type, overall mean operative time ranged from 360 to 420 min. Similarly, mean blood loss ranged from 260 to 480 ml. Mean in-hospital stay was about 9 d for all diversion types, with consistently high readmission rates. In series reporting on RARC with either extracorporeal or intracorporeal conduit diversion, overall 90-d complication rates were 59% (high-grade complication: 15%). In series reporting RARC with intracorporeal continent diversion, the overall 30-d complication rate was 45.7% (high-grade complication: 28%). Reported mortality rates were <3% for all diversion types. Comparing RARC and ORC, cumulative analyses demonstrated shorter operative time for ORC, whereas blood loss and in-hospital stay were better with RARC (all p values <0.003). Moreover, 90-d complication rates of any-grade and 90-d grade 3 complication rates were lower for RARC (all p values <0.04), whereas high-grade complication and mortality rates were similar. Conclusions RARC can be performed safely with acceptable perioperative outcome, although complications are common. Cumulative analyses demonstrated that operative time was shorter with ORC, whereas RARC may provide some advantages in terms of blood loss and transfusion rates and, more limitedly, for postoperative complication rates over ORC and LRC. Patient summary Although open radical cystectomy (RC) is still regarded as a standard treatment for muscle-invasive bladder cancer, laparoscopic and robot-assisted RC are becoming more popular. Robotic RC can be safely performed with acceptably low risk of blood loss, transfusion, and intraoperative complications; however, as for open RC, the risk of postoperative complications is high, including a substantial risk of major complication and reoperation.
Publication Type: Journal: Conference Paper
Source: EMBASE

Title: Robotic vs. open radical cystectomy in bladder cancer: A systematic review and meta-analysis.
Citation: European journal of surgical oncology : the journal of the European Society of Surgical Oncology and the British Association of Surgical Oncology, Nov 2014, vol. 40, no. 11, p. 1399-1411 (November 2014)
Author(s): Tang, K, Xia, D, Li, H, Guan, W, Guo, X, Hu, Z, Ma, X, Zhang, X, Xu, H, Ye, Z
Abstract: To evaluate the safety and efficacy of robot-assisted radical cystectomy (RARC) compared with open radical cystectomy (ORC) in the treatment of bladder cancer. A systematic search of Medline, Embase databases and the Cochrane Library was performed to identify studies that compared RARC and ORC and were published up to December 2012. Outcomes of interest included demographic and clinical characteristics, perioperative, pathologic variables and complications. Although there was a significant difference in the operating time in favor of ORC (WMD: 70.69 min; p < 0.001), patients having RARC might benefit from significantly fewer total complications (OR: 0.54; p < 0.001), less blood loss (WMD: -599.03 ml; p < 0.001), shorter length of hospital stay (WMD: -4.56 d; p < 0.001), lower blood transfusion rate (OR: 0.13; p = 0.002), less transfusion needs (WMD: -2.14 units; p <

0.001), shorter time to regular diet (WMD: -1.57 d; p = 0.002), more lymph node yield (WMD: 2.18 n; p = 0.001) and fewer positive lymph node (OR: 0.64; p = 0.03). There was no significant difference between the RARC and ORC regarding positive surgical margins. In early experience, our data suggest that RARC appears to be a safe, feasible and minimally invasive alternative to its open counterpart when performed by experienced surgeons in selected patients.
Source: Medline

Tandogdu Z1,2, Vale L2, Fraser C3, Ramsay C4.
A Systematic Review of Economic Evaluations of the Use of Robotic Assisted Laparoscopy in Surgery Compared with Open or Laparoscopic Surgery.
Appl Health Econ Health Policy. 2015 Oct;13(5):457-67. doi: 10.1007/s40258-015-0185-2.
http://www.ncbi.nlm.nih.gov/pubmed/26239361

Cochrane library - other reviews with critically appraised abstracts from the Centre for Reviews and Dissemination

None found

Cochrane library – Health Technology Assessments

None found

Randomised controlled trials / meta analysis

Title: Comparing open radical cystectomy and robot-assisted laparoscopic radical cystectomy: A randomized clinical trial
Citation: European Urology, June 2015, vol./is. 67/6(1042-1050), 0302-2838;1873-7560 (01 Jun 2015)
Author(s): Bochner B.H., Dalbagni G., Sjoberg D.D., Silberstein J., Keren Paz G.E., Donat S.M., Coleman J.A., Mathew S., Vickers A., Schnorr G.C., Feuerstein M.A., Rapkin B., Parra R.O., Herr H.W., Laudone V.P.
Language: English
Abstract: Background Open radical cystectomy (ORC) and urinary diversion in patients with bladder cancer (BCa) are associated with significant perioperative complication risk. Objective To compare perioperative complications between robot-assisted radical cystectomy (RARC) and ORC techniques. Design, setting, and participants A prospective randomized controlled trial was conducted during 2010 and 2013 in BCa patients scheduled for definitive treatment by radical cystectomy (RC), pelvic lymph node dissection (PLND), and urinary diversion. Patients were randomized to ORC/PLND or RARC/PLND, both with open urinary diversion. Patients were followed for 90 d postoperatively. Intervention Standard ORC or RARC with PLND; all urinary diversions were performed via an open approach. Outcome

measurements and statistical analysis Primary outcomes were overall 90-d grade 2-5 complications defined by a modified Clavien system. Secondary outcomes included comparison of high-grade complications, estimated blood loss, operative time, pathologic outcomes, 3- and 6-mo patient-reported quality-of-life (QOL) outcomes, and total operative room and inpatient costs. Differences in binary outcomes were assessed with the chi-square test, with differences in continuous outcomes assessed by analysis of covariance with randomization group as covariate and, for QOL end points, baseline score. Results and limitations The trial enrolled 124 patients, of whom 118 were randomized and underwent RC/PLND. Sixty were randomized to RARC and 58 to ORC. At 90 d, grade 2-5 complications were observed in 62% and 66% of RARC and ORC patients, respectively (95% confidence interval for difference, -21% to -13%; p = 0.7). The similar rates of grade 2-5 complications at our mandated interim analysis met futility criteria; thus, early closure of the trial occurred. The RARC group had lower mean intraoperative blood loss (p = 0.027) but significantly longer operative time than the ORC group (p < 0.001). Pathologic variables including positive surgical margins and lymph node yields were similar. Mean hospital stay was 8 d in both arms (standard deviation, 3 and 5 d, respectively; p = 0.5). Three- and 6-mo QOL outcomes were similar between arms. Cost analysis demonstrated an advantage to ORC compared with RARC. A limitation is the setting at a single high-volume, referral center; our findings may not be generalizable to all settings. Conclusions This trial failed to identify a large advantage for robot-assisted techniques over standard open surgery for patients undergoing RC/PLND and urinary diversion. Similar 90-d complication rates, hospital stay, pathologic outcomes, and 3- and 6-mo QOL outcomes were observed regardless of surgical technique. Patient summary Of 118 patients with bladder cancer who underwent radical cystectomy, pelvic lymph node dissection, and urinary diversion, half were randomized to open surgery and half to robot-assisted laparoscopic surgery. We compared the rate of complications within 90 d after surgery for the open group versus the robotic group and found no significant difference between the two groups.
Publication Type: Journal: Article
Source: EMBASE

Title: Health-related quality of life from a prospective randomised clinical trial of robot-assisted laparoscopic vs open radical cystectomy.
Citation: BJU international, Dec 2014, vol. 114, no. 6, p. 896-902 (December 2014)
Author(s): Messer, Jamie C, Punnen, Sanoj, Fitzgerald, John, Svatek, Robert, Parekh, Dipen J
Abstract: To compare health-related quality-of-life (HRQoL) outcomes for robot-assisted laparoscopic radical cystectomy (RARC) with those of traditional open radical cystectomy (ORC) in a prospective randomised fashion. This was a prospective randomised clinical trial evaluating the HRQoL for ORC vs RARC in consecutive patients from July 2009 to June 2011. We administered the Functional Assessment of Cancer Therapy-Vanderbilt Cystectomy Index questionnaire, validated to assess HRQoL, preoperatively and then at 3, 6, 9 and 12 months

postoperatively. Scores for each domain and total scores were compared in terms of deviation from preoperative values for both the RARC and the ORC cohorts. Multivariate linear regression was used to assess the association between the type of radical cystectomy and HRQoL. At the time of the study, 47 patients had met the inclusion criteria, with 40 patients being randomised for analysis. The cohorts consisted of 20 patients undergoing ORC and 20 undergoing RARC, who were balanced with respect to baseline demographic and clinical features. Univariate analysis showed a return to baseline scores at 3 months postoperatively in all measured domains with no statistically significant difference among the various domains between the RARC and the ORC cohorts. Multivariate analysis showed no difference in HRQoL between the two approaches in any of the various domains, with the exception of a slightly higher physical well-being score in the RARC group at 6 months. There were no significant differences in the HRQoL outcomes between ORC and RARC, with a return of quality of life scores to baseline scores 3 months after radical cystectomy in both cohorts. © 2014 The Authors. BJU International © 2014 BJU International.
Source: Medline

Cost effectiveness

Title: The Health Economics of Bladder Cancer: An Updated Review of the Published Literature
Citation: PharmacoEconomics, October 2014, vol./is. 32/11(1093-1104), 1170-7690;1179-2027 (25 Oct 2014)
Author(s): Yeung C., Dinh T., Lee J.
Language: English
Abstract: The purpose of this paper is to provide a current view of the economic burden of bladder cancer, with a focus on the cost effectiveness of available interventions. This review updates a previous systematic review and includes 72 new papers published between 2000 and 2013. Bladder cancer continues to be one of the most common and expensive malignancies. The annual cost of bladder cancer in the USA during 2010 was $US4 billion and is expected to rise to $US5 billion by 2020. Ten years ago, urinary markers held the potential to lower treatment costs of bladder cancer. However, subsequent real-world experiments have demonstrated that further work is necessary to identify situations in which these technologies can be applied in a cost-effective manner. Adjunct cytology remains a part of diagnostic standard of care, but recent research suggests that it is not cost effective due to its low diagnostic yield. Analysis of intravesical chemotherapy after transurethral resection of bladder tumor (TURBT), neo-adjuvant therapy for cystectomy, and robot-assisted laparoscopic cystectomy suggests that these technologies are cost effective and should be implemented more widely for appropriate patients. The existing literature on the cost effectiveness of bladder cancer treatments has improved substantially since 2000. The body of work now includes many new models, registry analyses, and real-world studies. However, there is still a need for

new implementation guidelines, new risk modeling tools, and a better understanding of the empirical burden of bladder cancer.
Publication Type: Journal: Review
Source: EMBASE
Full Text:
Available from *EBSCOhost* in PharmacoEconomics

Hermans T, Fossion L. What about conventional laparoscopic radical cystectomy? Cost-analysis of open versus laparoscopic radical cystectomy. Journal of Endourology.2014;28(4):410-415.
http://onlinelibrary.wiley.com/o/cochrane/cleed/articles/NHSEED-22013047296/frame.html

Cohort

Title: Robot-assisted en-bloc radical cystectomy with nephroureterectomy and intracorporal urinary diversion in ten patients with muscle-invasive bladder cancer and simultaneous upper urinary tract urothelial cell carcinoma or functionless kidney
Citation: European Urology, Supplements, April 2015, vol./is. 14/2(eV45), 1569-9056 (April 2015)
Author(s): Buse S., Hach C., Alexandrov A.
Language: English
Abstract: INTRODUCTION & OBJECTIVES: To describe our technique of robot-assisted en-bloc radical cystectomy with nephroureterectomy and intracorporal urinary diversion. The video shows in detail all steps of the procedure from port placement (seven-port transperitoneal approach) over the ablative steps (bladder and kidney resection and pelvic lymph node dissection) to the fully intracorporal robot-assisted reconstruction. We also report on intra-and postoperative bench-marks of the procedure in a series of ten patients presenting muscleinvasive bladder cancer and synchronous upper urinary tract urothelial cell carcinoma. MATERIAL & METHODS: After informed consent, we evaluated 10 patients undergoing an en-bloc radical cystectomy and nephroureterectomy at Alfried Krupp Hospital, Germany. All procedures were performed by one surgeon. We primarily assessed surgery and console duration, conversion rate, blood loss, intraoperative transfusion, and resection status. Secondary endpoints were postoperative transfusions, intra-, and postoperative complications. RESULTS: Six of the patients were male. Median age was 74 years (Q1-Q3 76,5-76,5), the median BMI was 27,9 kg/m² (Q1-Q3 28-28). Three patients were ASA 2, six - ASA 3 and one - ASA 4. The indication for an en-bloc radical cystectomy and nephroureterectomy was simultaneous transitional cell cancer of the lower and upper urinary tract in 3 patients. The other 7 patients had a muscle-invasive bladder cancer and a functionless kidney. Urinary diversion was reconstructed as intracorporal ureterocutaneostomy in 8 and as extracorporal ileum conduit in two patients. Surgery lasted 307 min, thereof 198 min console time on average. There was no conversion to open surgery. The mean blood loss was 207 ml and only one patient required postoperative blood

transfusions. Resection margins were tumor-free in 9 cases (90%). The patient with positive resection margins presented with tumor stage pT4a. Postoperative complications occurred in 4 patients: paralytic Ileus (Clavien-Dindo class 1 (CDC 1)-1, Singultus (CDC1)-1, postoperative blood transfusions (CDC2)-1 and port hernia (CDC 3b)- 1. CONCLUSIONS: Robot-assisted en-bloc radical cystectomy and nephroureterectomy could be performed with acceptable surgery durations with a high intra- and postoperatively safety. Further surgeries have to be performed to evaluate functional and oncologic results.
Publication Type: Journal: Conference Abstract
Source: EMBASE

Title: The RAZOR (randomized open vs robotic cystectomy) trial: study design and trial update.
Citation: BJU international, Feb 2015, vol. 115, no. 2, p. 198-205 (February 2015)
Author(s): Smith, Norm D, Castle, Erik P, Gonzalgo, Mark L, Svatek, Robert S, Weizer, Alon Z, Montgomery, Jeffrey S, Pruthi, Raj S, Woods, Michael E, Tollefson, Matthew K, Konety, Badrinath R, Shabsigh, Ahmad, Krupski, Tracey, Barocas, Daniel A, Dash, Atreya, Quek, Marcus L, Kibel, Adam S, Parekh, Dipen J
Abstract: The purpose of the RAZOR (randomized open vs robotic cystectomy) study is to compare open radical cystectomy (ORC) vs robot-assisted RC (RARC), pelvic lymph node dissection (PLND) and urinary diversion for oncological outcomes, complications and health-related quality of life (HRQL) measures with a primary endpoint of 2-year progression-free survival (PFS). RAZOR is a multi-institutional, randomized, non-inferior, phase III trial that will enrol at least 320 patients with T1-T4, N0-N1, M0 bladder cancer with ≈160 patients in both the RARC and ORC arms at 15 participating institutions. Data will be collected prospectively at each institution for cancer outcomes, complications of surgery and HRQL measures, and then submitted to trial data management services Cancer Research and Biostatistics (CRAB) for final analyses. To date, 306 patients have been randomized and accrual to the RAZOR trial is expected to conclude in 2014. In this study, we report the RAZOR trial experimental design, objectives, data safety, and monitoring, and accrual update. The RAZOR trial is a landmark study in urological oncology, randomizing T1-T4, N0-N1, M0 patients with bladder cancer to ORC vs RARC, PLND and urinary diversion. RAZOR is a multi-institutional, non-inferiority trial evaluating cancer outcomes, surgical complications and HRQL measures of ORC vs RARC with a primary endpoint of 2-year PFS. Full data from the RAZOR trial are not expected until 2016-2017.

Source: Medline

Case studies

Title: Surgical advances in bladder cancer: at what cost?

Citation: The Urologic clinics of North America, May 2015, vol. 42, no. 2, p. 235 (May 2015)
Author(s): Johnson, David C, Greene, Peter S, Nielsen, Matthew E
Abstract: Bladder cancer is the most expensive cancer to treat from diagnosis to death. Frequent disease recurrence, intense follow-up, and expensive, invasive techniques for diagnosis and treatment drive these costs for non-muscle invasive bladder cancer. Fluorescence cystoscopy increases the detection of superficial bladder cancer and reduces costs by improving the quality of resection and reducing recurrences. Radical cystectomy with intestinal diversion is the mainstay of treatment of invasive disease; however it is associated with substantial cost and morbidity. Increased efforts to improve the surgical management of bladder cancer while reducing the cost of treatment are increasingly necessary.
Source: Medline

Title: Organ-sparing surgery in urology: Partial cystectomy
Citation: Current Opinion in Urology, March 2015, vol./is. 25/2(111-115), 0963-0643;1473-6586 (06 Mar 2015)
Author(s): Knoedler J., Frank I.
Language: English
Abstract: While radical cystectomy continues to be the gold standard for surgical management of muscle invasive bladder cancer, there has been a renewed interest in partial cystectomy as a viable treatment alternative. The purpose of this review is to summarize and discuss the recent literature regarding partial cystectomy for bladder cancer. RECENT FINDINGS: Utilization of partial cystectomy has remained stable, at a rate of 7-10% of all cystectomies performed nationally. Additionally, recent population-based series as well as single institution cohorts have found that partial cystectomy did not compromise survival when compared to radical cystectomy. While patients may recur, those with organ-confined disease had no difference in survival following salvage cystectomy when compared to primary radical cystectomy. Current data indicate 14% of patients experience an in-hospital complication, which is a marked decrease compared to radical cystectomy. Finally, innovations in surgical technique, such as robotics, as well as the inclusion of partial cystectomy into trimodal therapy, offer exciting new frontiers in bladder cancer treatment. SUMMARY: Once maligned, partial cystectomy now represents a standard-of-care option for management of bladder cancer. Although additional research is needed to clarify patient selection and outcomes, partial cystectomy is an important treatment option for appropriately selected patients.
Publication Type: Journal: Review
Source: EMBASE

Title: A pilot ex vivo evaluation of a telerobotic system for transurethral intervention and surveillance

Citation: Journal of Endourology, February 2015, vol./is. 29/2(231-234), 0892-7790;1557-900X (01 Feb 2015)
Author(s): Pickens R.B., Bajo A., Simaan N., Herrell D.
Language: English
Abstract: Introduction: Transurethral resection of bladder tumor (TURBT) and pathological staging are both standard surgical therapies for nonmuscle-invasive bladder cancer and integral parts of the diagnostic evaluation and progression monitoring of all bladder tumors. We developed and tested a dexterous robot that can fit through a standard resectoscope for evaluation for possible en bloc resection of bladder tumors, especially tumors along the dome and anterior wall of the bladder. Materials and Methods: Our dexterous robot uses a continuum (snake-like) mechanical architecture with three working channels through which a fiberscope, biopsy graspers, and a holmium laser were placed. The continuum robot has two segments. Using indigo carmine, injections were performed through the detrusor muscle into the mucosa of the ex vivo bovine bladders at a total of 11 positions throughout all quadrants of the bladder. The snake robot was used in conjunction with the holmium laser to ablate nine of the lesions; two additional lesions were resected en bloc using the grasper and the laser down through the muscle layer. Results: Both experiments showed that the robotic system was able to directly visualize all 11 targets. In both the bladders, we were able to resect en bloc two tumors using the grasper and 200mum holmium laser fiber down to the muscle layer indicating a good resection. All of the other targets were completely ablated using the holmium laser. Conclusion: The dexterous robot allowed for visualization as well as provided adequate ablation and en bloc resection of bladder lesions throughout the entire bladder.
Publication Type: Journal: Article
Source: EMBASE

Title: Robotic implantation of biodegradable regenerative urinary conduit: experimental study.
Citation: Journal of endourology / Endourological Society, Jan 2015, vol. 29, no. 1, p. 52-57 (January 2015)
Author(s): de Castro Abreu, Andre Luis, Azhar, Raed A, Berger, Andre K, Chopra, Sameer, Marien, Arnaud, Santomauro, Michael, Satkunasivam, Raj, Sun, Yi, Aron, Monish, Ukimura, Osamu, Desai, Mihir M, Gill, Inderbir S
Abstract: To determine the feasibility and develop a robotic technique for intracorporeal implantation of a biodegradable tubular scaffold seeded with adipose-sourced smooth muscle cells (Neo-Urinary-Conduit) that, when implanted as a conduit for urinary diversion, facilitates regeneration of native-like neourinary tissue. Robotic NUC implantation was performed in two fresh male cadavers. The greater omentum was widely detached from the greater curvature of the stomach, in preparation for final wrapping of the conduit. Bilateral ureters were mobilized for implantation. The NUC, with two precreated ureteral openings, was inserted into the abdomen. Bilateral, stented uretero-NUC anastomoses were created. The NUC was circumferentially wrapped with the predissected omentum, exteriorized through the abdominal wall, and maturated. Both procedures were successfully completed

intracorporeally. Operative time for NUC implantation was 90 and 100 minutes, respectively. Examination of gross anatomy showed no injury to other organs. There was no omental kinking, rotation, eversion, or stripping from the NUC. Bilateral stents were confirmed to be in situ with the proximal coil in the kidney. Uretero-NUC anastomoses and omentum were tension free. The entire NUC, including its distal edge and posterior aspect, was circumferentially wrapped 360 degrees. We demonstrated the feasibility and developed a robotic technique for intracorporeal implantation of a biodegradable regenerative urinary conduit. This study serves as the foundation for the robotic surgical technique before the clinical application.
Source: Medline

Title: Vaginal sparing robot assisted laparoscopic radical cystectomy
Citation: Journal of Endourology, September 2014, vol./is. 28/(A310), 0892-7790 (September 2014)
Author(s): Jain S., Shahrour K.
Language: English
Abstract: INTRODUCTION AND OBJECTIVES: Vaginal sparing cystectomy in conjunction with an orthotopic neo-bladder was popularized in the early to mid-1990's. One of the other afforded benefits of the vaginal sparing procedure was improvement in sexual functional outcome for the treated women. There have been limited case series describing open and laparoscopic vaginal sparing cystectomy and very few describing this technique via a robot assisted platform. In this video, we present our technique for a vaginal sparing robot assisted laparoscopic radical cystectomy with hysterectomy. METHODS: Our patient is an otherwise healthy and sexually active 56 year old woman. She underwent a cystectomy for recurrent high grade T1 bladder cancer following induction BCG therapy. The radical cystectomy, hysterectomy and extended pelvic lymph node dissection were performed via the robotic platform, whereas the ileal conduit was performed open. RESULTS: Total robot time was 240 minutes. Estimated blood loss was 200 mL. No nasogastric tube was left in place and her total length of stay was 8 days. She had return to flatus on POD#5 and at most recent follow up has not had any complications. Her final pathology report was pT0, N0, Mx, all margins negative. CONCLUSIONS: Vaginal sparing robot assisted laparoscopic radical cystectomy is a suitable option for the female patient who wishes to remain sexually active following her cystectomy as it allows for preservation of the length and girth of the vagina.
Publication Type: Journal: Conference Abstract
Source: EMBASE

Title: Step-by-step technique description of robot-assisted radical cystectomy and fully intracorporal ileal conduit diversion
Citation: European Urology, Supplements, September 2014, vol./is. 13/3(57-58), 1569-9056 (September 2014)
Author(s): Alexandrov A., Kassabov B., Krude J., Klumpen P., Hach C., Goell A., Buse S.
Language: English

Abstract: Introduction & Objectives: To describe our technique of robot- assisted intracorporal radical cystectomy, lymph node dissection and fully intracorporal ileal conduit reconstruction that we apply in patients with muscle-invasive urothelial urinary bladder cancer. The video shows in detail all steps of the procedure from port placement (seven-port transperitoneal approach) over the ablative steps (bladder and prostate resection and pelvic lymph node dissection) to the fully intracorporal robot-assisted ileal conduit reconstruction. Material & Methods: The robotic cystectomy is performed via a sixport transperitoneal approach. We used 1 camera port (12 mm), 2 robot ports (8 mm), 1 assistant port (12 mm), 1 hybrid port (1 robot port (8 mm) inserted within an assistant port (12 mm)), and a suction port (5 mm). Results: In this case of our series, surgery lasted 297 min, thereof 2001 min console time. The blood loss was 238 ml. Resection margins were tumor-free. There were no intra- or postoperative complications. Conclusions: Robotic-assisted radical cystectomy could be performed with acceptable surgery durations and without intraoperative and postoperative complications. Further procedures have to be performed to evaluate functional and oncologic safety.
Publication Type: Journal: Conference Abstract
Source: EMBASE

Title: Best practices in robot-assisted radical cystectomy and urinary reconstruction: Recommendations of the pasadena consensus panel
Citation: European Urology, March 2015, vol./is. 67/3(363-375), 0302-2838;1873-7560 (01 Mar 2015)
Author(s): Wilson T.G., Guru K., Rosen R.C., Wiklund P., Annerstedt M., Bochner B.H., Chan K.G., Montorsi F., Mottrie A., Murphy D., Novara G., Peabody J.O., Palou Redorta J., Skinner E.C., Thalmann G., Stenzl A., Yuh B., Catto J.
Language: English
Abstract: Context Robot-assisted surgery is increasingly used for radical cystectomy (RC) and urinary reconstruction. Sufficient data have accumulated to allow evidence-based consensus on key issues such as perioperative management, comparative effectiveness on surgical complications, and oncologic short- to midterm outcomes. Objective A 2-d conference of experts on RC and urinary reconstruction was organized in Pasadena, California, and the City of Hope Cancer Center in Duarte, California, to systematically review existing peer-reviewed literature on robot-assisted RC (RARC), extended lymphadenectomy, and urinary reconstruction. No commercial support was obtained for the conference. Evidence acquisition A systematic review of the literature was performed in agreement with the PRISMA statement. Evidence synthesis Systematic literature reviews and individual presentations were discussed, and consensus on all key issues was obtained. Most operative, intermediate-term oncologic, functional, and complication outcomes are similar between open RC (ORC) and RARC. RARC consistently results in less blood loss and a reduced need for transfusion during surgery. RARC generally requires longer operative time than ORC, particularly with intracorporeal reconstruction. Robotic assistance provides ergonomic value for surgeons. Surgeon experience and institutional volume strongly predict favorable outcomes for either open or robotic techniques. Conclusions RARC appears to be similar to ORC in terms of operative,

pathologic, intermediate-term oncologic, complication, and most functional outcomes. RARC consistently results in less blood loss and a reduced need for transfusion during surgery. RARC can be more expensive than ORC, although high procedural volume may attenuate this difference. Patient summary Robot-assisted radical cystectomy (RARC) is an alternative to open surgery for patients with bladder cancer who require removal of their bladder and reconstruction of their urinary tract. RARC appears to be similar to open surgery for most important outcomes such as the rate of complications and intermediate-term cancer-specific survival. Although RARC has some ergonomic advantages for surgeons and may result in less blood loss during surgery, it is more time consuming and may be more expensive than open surgery.
Publication Type: Journal: Conference Paper
Source: EMBASE

Long term / retrospective / follow up studies

Title: Oncological outcomes of totally intracorporeal robot-assisted radical cystectomy: Results from the ERUS scientific working group
Citation: Journal of Urology, April 2015, vol./is. 193/4 SUPPL. 1(e857), 0022-5347 (April 2015)
Author(s): Collins J., Hosseini A., Schumacher M., Canda A., Wijburg C., Schwentner C., Stenzl A., Balbay D., Decaestecker K., Edeling S., Pokupic S., Guru K., Mottrie A., Wiklund P.
Language: English
Abstract: INTRODUCTION AND OBJECTIVES: Data on the oncological outcomes in patients undergoing robot-assisted radical cystectomy (RARC) is limited. Globally extracorporeal urinary diversion following RARC remains the most common approach despite potential advantages of a completely minimally invasive approach. We report oncological outcomes and associated prognostic factors from a multi-institutional European database focusing on the centres performing totally intracorporeal RARC. METHODS: In the ERUS scientific working group database, 467 patients underwent totally intracorporeal RARC for bladder cancer between 2003 and 2014. Clinical and pathological data at the time of the latest follow-up was reviewed. Recurrence free survival (RFS), cancer specific survival (CSS) and overall survival (OS) were the outcomes of interest and evaluated using the Kaplan Meier estimator. Multivariable Cox regression analysis was performed to identify factors associated with outcomes of interest. RESULTS: Mean age was 67 years, 80% were men. 384 (82%) patients were alive at the time of the analysis. Median follow-up was 17.9 months (range 1-130 months). 87 patients (19%) had undergone surgery 3 or more years' ago. Median follow-up of patients alive was 16 months. 31% patients had pathological non organ-confined disease. Positive surgical margins were present in 5%; median lymph node yield was 18 with 19% of patients having positive lymph nodes. The 3-year RFS, CSS and OS were 73%, 75% and 73% respectively. On multivariable analysis, non-organ confined disease was found to impact RFS, CSS and OS (HR 4.0, 4.3 and 4.2 respectively) and LN positive disease was associated

with poorer RFS (HR 2.1). Histopathology stage pT0 was a positive prognostic indicator associated with better RFS, CSS and OS (HR 0.15, 0.16 and 0.74 respectively). CONCLUSIONS: This is the largest reported multi-institutional cohort of totally intracorporeal RARC showing acceptable medium term survival outcomes comparable to open radical cystectomy series. The ERUS scientific working group database indicates that a totally intracorporeal approach is replicable.
Publication Type: Journal: Conference Abstract
Source: EMBASE

Title: Critical analysis of hospital readmission and cost burden after robot-assisted radical cystectomy
Citation: Journal of Urology, April 2015, vol./is. 193/4 SUPPL. 1(e804), 0022-5347 (April 2015)
Author(s): Wittig K., Ruel N., Hawks B., Chan K., Lau C., Wilson T., Yuh B.
Language: English
Abstract: INTRODUCTION AND OBJECTIVES: Radical cystectomy for bladder cancer is associated with significant risk of complications and readmission after surgery. Herein we examine the occurrence and cost burden of hospital readmission within 90 days of robot-assisted radical cystectomy (RARC). METHODS: We examined 242 patients who underwent RARC with extracorporeal urinary diversion and were consented to an IRB approved cystectomy database from 2003 to 2012. Continent diversions were performed in 67% of patients. Readmissions to any facility and for any complication were included for analysis. Multiple readmissions within the first 90 days were captured as separate events. Early readmission was defined as rehospitalization within 30 days of surgery. Late readmission captured rehospitalization between 31-90 days after RARC. Cost analysis was performed using average direct hospital cost for patients without a readmission as an index. The Fisher exact test was used to determine differences in proportion of readmissions between specific patient groups, while logistic regression was used to identify predictors for various reasons for readmission. RESULTS: Ninety-eight (40%) patients were readmitted to the hospital at least once within 90 days after RARC, 76% as early and 23% as late readmissions, with 27 (11%) readmitted at least twice. Readmissions took place a median of 12 days (IQR: 5-29) after initial discharge with a median readmission hospital stay of 7 days (IQR: 4-11). The most common reasons for early initial readmission were infections (30%) and dehydration (16%), and for late readmission infections (9%) and ureteral stricture (6%). In a multivariable analysis, estimated blood loss was a predictor of any readmission (OR 1.001, p=.04). For infection readmissions, initial length of hospital stay < 8 days was a significant predictor (OR 2.6, p=.004). Patients receiving blood transfusions had an increased risk of being readmitted for dehydration (OR 2.8, p=.03). Patients readmitted to the hospital had direct costs 1.42x those who did not require readmission. Readmissions for ileus (48% higher), small bowel obstruction (39% higher), or ureteral stricture (17% higher) contributed to the highest cost of readmission, while ureteral stricture (23% higher), pelvic abscess (7% higher), and small bowel obstruction (6% higher) were the most costly per day of hospitalization. CONCLUSIONS: Readmission rates after RARC are high and present a significant

financial burden. By studying the most common causes and addressing them pre-emptively, efforts can be made to reduce readmission occurrence and severity.
Publication Type: Journal: Conference Abstract
Source: EMBASE

Title: Differences in the distribution of recurrence locations between patients who undergo open and robot-assisted radical cystectomy for bladder cancer
Citation: European Urology, Supplements, April 2015, vol./is. 14/2(e656), 1569-9056 (April 2015)
Author(s): Nguyen D.P., Al Hussein Al Awamlh B., Wu X., Inoyatov I.M., Ayangbesan A., Faltas B.M., Christos P.J., O'Malley P., Scherr D.S.
Language: English
Abstract: INTRODUCTION & OBJECTIVES: Concerns remain whether robot-assisted radical cystectomy (RARC) compromises survival because of inadequate oncologic resection or alteration of recurrence patterns. In this study, we aimed to compare recurrence patterns and evaluate factors predicting recurrence following open radical cystectomy (ORC) and RARC. MATERIAL & METHODS: A total of 383 consecutive patients who underwent radical cystectomy (120 ORCs, 263 RARCs) at an academic institution from July 2001 to February 2014 were included. Descriptive statistics were used to compare recurrence patterns at 2 years. Recurrence-free survival estimates were generated using the Kaplan-Meier method. Cox regression models were built to evaluate the effects of clinicopathologic variables and operative technique on the risk of recurrence. RESULTS: At 2 and 3 years, recurrence-free survival rates were 68% and 63% for ORC and 73% and 71% for RARC, respectively (log rank p=0.11). Rates of local recurrence at 2 years were similar between ORC and RARC patients (Table). Similarly, distant recurrence rates at 2 years were not different between ORC and RARC patients. However, the distribution of sites of first recurrence was significantly different between the two surgical techniques (Table). Specifically, extrapelvic lymph node locations (4/26 ORC patients with distant recurrence vs 10/43 RARC patients with distant recurrence) and peritoneal carcinomatosis (2/26 ORC patients with distant recurrence vs 9/43 RARC patients with distant recurrence) were numerically more frequent in RARC patients than in ORC patients. In multivariable analyses, RARC was not an independent predictor of recurrence, adjusting for age, gender, clinical stage, perioperative chemotherapy, pathologic stage, nodal stage, positive surgical margin, and lymphovascular invasion (HR 0.78, 85%CI 0.5-1.21; p=0.2). CONCLUSIONS: In our series, recurrence-free survival was similar following ORC and RARC, and RARC provided no additional risk of recurrence compared to ORC. However, the distribution of distant recurrences was statistically different between the two techniques, with extrapelvic lymph node locations and peritoneal carcinomatosis found more frequently in RARC patients. If confirmed in larger studies, these findings may lead to a reappraisal of the value of RARC. (Table Presented).
Publication Type: Journal: Conference Abstract
Source: EMBASE

Title: Robot-assisted radical cystectomy using a side-docking technique.

Citation: Journal of laparoendoscopic & advanced surgical techniques. Part A, Mar 2015, vol. 25, no. 3, p. 207-211 (March 2015)
Author(s): Chan, Eddie Shu-yin, Yee, Chi-hang, Chiu, Peter Ka-fung, Chan, Chi-kwok, Hou, See-ming, Ng, Chi-fai
Abstract: Robot-assisted radical cystectomy (RARC) was first introduced in 2003. Although there have been modifications to the surgical techniques over the years, in every published RARC series the surgical robot is invariably docked between the patient's legs. We evaluated the use of a side-docking approach in RARC. Ten RARCs using a side-docking technique were performed at a single institute between February 2013 and February 2014. The patients' clinical notes and operative findings were reviewed. The results were compared with results from RARCs using the conventional central-docking method from our historical cohort. There were no significant arm collisions in the side-docking RARC procedures. The perineum was readily accessible in all cases that used the side-docking method. A simultaneous urethrectomy was performed in 1 case with a side-docking approach. The median operative times were 417.5 minutes (range, 345-515 minutes) and 405.0 minutes (range, 330-500 minutes) in the central-docking and side-docking groups, respectively. There were no statistically significant differences in operation time, transfusion rate, complication rate, or hospital stay between the two groups. A side-docking approach in RARC provides better perineal access with the advantage of allowing simultaneous urethrectomy and transvaginal retrieval of the specimen without compromising the dexterity and precision of the robotic surgical system.
Source: Medline

Title: Standardized analysis of complications after robot-assisted radical cystectomy: Korea University Hospital experience.
Citation: Korean journal of urology, Jan 2015, vol. 56, no. 1, p. 48-55 (January 2015)

Author(s): Pyun, Jong Hyun, Kim, Hyung Keun, Kim, Jae Yoon, Kim, Seung Bin, Cho, Seok, Kang, Sung Gu, Ko, Young Hwii, Cheon, Jun, Lee, Jeong Gu, Kim, Je Jong, Kang, Seok Ho
Abstract: To analyze the complications after robot-assisted radical cystectomy (RARC) by use of a standardized reporting methodology by a single surgeon. We prospectively reviewed a maintained institutional database of 52 patients who underwent RARC to manage bladder cancer and were followed up in 3 months by a single surgeon at Korea University Medical Center from 2007 through 2014. All complications within 90 days of surgery were defined and categorized into 5 grades according to the Clavien-Dindo classification. Logistic regression analysis was used to identify predictors of complications. Fifty percent of patients (26 of 52) experienced a complication of any grade <90 days after surgery, and 11 patients (21.2%) experienced a major complication. Complications were grouped in systems-based categories. Fifty complications occurred in 52 patients and hematologic complication (transfusion) was the most common (13 of 52). Wound dehiscence, anastomotic leakage, urinary tract obstruction, mechanical obstruction, and

thromboembolism occurred as major complications. Mean estimated blood loss (EBL) was 247 mL and mean total operative time was 496 minutes. The mean number of lymph nodes harvested was 24.6, with 30.5 for extended dissection. EBL (over 300 mL), operative time, and method of urinary diversion were significant negative predictors of minor complications, whereas EBL (over 300 mL) was a significant negative predictor of major complications ($p<0.05$). The present results show that the complication rate reported by use of a standardized methodology after robotic radical cystectomy is still considerable although comparable to that of contemporary robot series. EBL, operative time, and diversion methods were predictors of complications.
Source: Medline
Full Text:
Available from *National Library of Medicine* in Korean Journal of Urology

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Title: Robotic intracorporeal orthotopic neobladder during radical cystectomy in 132 patients.
Citation: The Journal of urology, Dec 2014, vol. 192, no. 6, p. 1734-1740 (December 2014)
Author(s): Desai, Mihir M, Gill, Inderbir S, de Castro Abreu, Andre Luis, Hosseini, Abolfazl, Nyberg, Tommy, Adding, Christofer, Laurin, Oscar, Collins, Justin, Miranda, Gus, Goh, Alvin C, Aron, Monish, Wiklund, Peter
Abstract: We present a 2-institution experience with completely intracorporeal robotic orthotopic ileal neobladder after radical cystectomy in 132 patients. Established open surgical techniques were duplicated robotically with all neobladders suture constructed intracorporeally in a globular configuration. Nerve sparing was performed in 56% of males. Lymphadenectomy was extended (up to aortic bifurcation in 51, 44%) and superextended (up to the inferior mesenteric artery in 20, 17%). Ureteroileal anastomoses were Wallace-type (86, 65%) or Bricker-type (46, 35%). The learning curve at each institution was assessed using chronological subgroups and by trends across the entire cohort. Data were prospectively collected and retrospectively queried. Mean operating time was 7.6 hours (range 4.4 to 13), blood loss was 430 cc (range 50 to 2,200) and hospital stay was 11 days (median 8, range 3 to 78). Clavien grade I, II, III, IV and V complications within 30 days were 7%, 25%, 13%, 2% and 0%, respectively, and between 30 and 90 days were 5%, 9%, 11%, 1% and 2%, respectively. Mean nodal yield was 29 (range 7 to 164) and the node positivity rate was 17%. Operative time, blood loss, hospital stay and prevalence of late complications improved with experience. During a mean followup of 2.1 years (range 0.1 to 9.8) cancer recurred in 20 patients (15%). Five-year overall, cancer specific and recurrence-free survival was 72%, 72% and 71%, respectively. We developed a refined technique of robotic intracorporeal orthotopic neobladder diversion, duplicating open principles. Operative efficiency and outcomes improved with experience. Going forward, we propose a prospective randomized comparison between open and robotic intracorporeal neobladder surgery.

Source: Medline

Title: Oncologic outcomes between open and robotic-assisted radical cystectomy: a propensity score matched analysis.
Citation: World journal of urology, Dec 2014, vol. 32, no. 6, p. 1441-1446 (December 2014)
Author(s): Ahdoot, Michael, Almario, Leanne, Araya, Hiwot, Busch, Jonas, Conti, Simon, Gonzalgo, Mark L
Abstract: To compare oncologic outcomes between open radical cystectomy (ORC) and robotic-assisted radical cystectomy (RARC) using propensity score (PS) matching of preoperative variables. A group of 51 consecutive patients who underwent RARC between 2009 and 2012 were matched by propensity scoring with an equal number of patients who underwent ORC. Patient demographics, clinical staging, pathologic staging, pathologic grading, histology, positive margin status, lymph node yield, duration of hospital stay, and overall survival were examined. PS-matched ORC and RARC cohorts demonstrated no significant differences with respect to preoperative variables, pathologic stage, grade, histology, metastasis at preoperative staging, and postoperative positive margin status. There were statistically significant differences in nodal status (66.7 % N0 for ORC vs. 80.4 % N0 for RARC, $p = 0.039$) and median lymph node yield (6 for ORC vs. 18 for RARC, $p < 0.0001$). No positive soft tissue margins were observed in the RARC group compared to 5.9 % in the ORC group ($p = 0.332$). There were no significant differences in mean duration of hospital stay or mean overall survival between ORC and RARC. ORC and RARC represent effective surgical approaches for the treatment of bladder cancer. Histopathologic outcomes for RARC compare favorably to ORC with respect to soft tissue margin rates and lymph node yield. These data suggest that RARC is an acceptable surgical approach for treatment of bladder cancer that can achieve outcomes that are equal or superior to those of ORC.
Source: Medline

Title: Robotic intracorporeal urinary diversion: technical details to improve time efficiency.
Citation: Journal of endourology / Endourological Society, Nov 2014, vol. 28, no. 11, p. 1320-1327 (November 2014)
Author(s): Desai, Mihir M, de Abreu, Andre Luis Castro, Goh, Alvin C, Fairey, Adrian, Berger, Andre, Leslie, Scott, Xie, Hui Wen, Gill, Karanvir S, Miranda, Gus, Aron, Monish, Sotelo, Rene J, Sun, Yinghao, Xu, Zhang, Gill, Inderbir Singh
Abstract: To present time-efficiency data during our initial experience with intracorporeal urinary diversion and technical tips that may shorten operative time early in the learning curve. Data were analyzed in the initial 37 consecutive patients undergoing robotic radical cystectomy and intracorporeal urinary diversion in whom detailed stepwise operative time data were available. Median age was 65 years and median body mass index was 27. Neoadjuvant chemotherapy was administered in 6 patients and 11 patients had clinical evidence of T3 or lymph node-positive disease. Each component of the operation was subdivided into specific steps and operative

time for each step was prospectively recorded. Peri-operative and follow-up data up to 90 days and final pathological data were recorded. All procedures were completed intracorporeally and robotically without need for conversion to open surgery or extracorporeal diversion. Median total operative time was 387 vs 386 minutes (p=0.2) and median total console time was 361 vs 295 minutes (p<0.007) for orthotopic neobladder and ileal conduit, respectively. Median time for radical cystectomy was 77 minutes, extended pelvic lymph node dissection was 63 minutes, and diversion was 111 minutes (ileal conduit 92 minutes and orthotopic neobladder 124 minutes). Median estimated blood loss was 250 mL, and median hospital stay was 9 days. High grade (Clavien grade 3-5) complications at 30 and 90 days follow-up were recorded in 6 (16%) and 9 (24%) patients, respectively. Over a median follow-up of 16 months, 12 (32%) patients experienced disease recurrence and 9 (24%) died from bladder cancer. These correspond to 1-year recurrence-free and overall survival of 64% and 70%, respectively. Intracorporeal urinary diversion following robotic radical cystectomy can be safely performed and reproducible in a time-efficient manner even during the early learning curve.
Source: Medline

Title: Oncologic outcomes following robot-assisted radical cystectomy with minimum 5-year follow-up: the Roswell Park cancer institute experience.
Citation: European urology, Nov 2014, vol. 66, no. 5, p. 920-928 (November 2014)
Author(s): Raza, Syed Johar, Al-Daghmin, Ali, Zhuo, Sharon, Mehboob, Zayn, Wang, Katy, Wilding, Gregory, Kauffman, Eric, Guru, Khurshid A

Abstract: Long-term oncologic outcomes following robot-assisted radical cystectomy (RARC) remain scarce. To report long-term oncologic outcomes following RARC at a single institution. Retrospective review of 99 patients who underwent RARC for urothelial carcinoma of bladder between 2005 and 2009. RARC was performed. Primary outcomes included recurrence-free survival (RFS), cancer-specific survival (CSS), and overall survival (OS), measured by the Kaplan-Meier method. The association between primary outcomes and perioperative and pathologic factors was assessed using a multivariable Cox proportional hazards model. Fifty-one (52%) patients had stage pT3 or higher disease. Eight (8%) patients had positive margins and 30 (30%) had positive lymph nodes (LNs), with a median of 21 LNs removed. Median follow-up for patients alive was 74 mo. The 5-yr RFS, CSS, and OS rates were 52.5%, 67.8%, and 42.4%, respectively. Tumor stage, LN stage, and margin status were each significantly associated with RFS, CSS, and OS. On multivariable analysis, tumor and LN stage were independent predictors of RFS, CSS, and OS, while positive margin status and Charlson comorbidity index predicted worse OS and CSS. Adjuvant chemotherapy predicted RFS only. Retrospective design and lack of open comparison are main limitations of this study. Long-term oncologic outcomes following RARC demonstrate RFS and CSS estimates similar to those reported in literature for open radical cystectomy. Randomized controlled trials can better define outcomes of any alternative technique. Survival data 5 yr after RARC for bladder cancer demonstrate that survival outcomes are dependent on the same oncologic

parameters as previously reported for open surgery. Copyright © 2014 European Association of Urology. Published by Elsevier B.V. All rights reserved.
Source: Medline

Title: Commentary on "Robot-assisted laparoscopic vs open radical cystectomy: Comparison of complications and perioperative oncological outcomes in 200 patients." Kader AK, Richards KA, Krane LS, Pettus JA, Smith JJ, Hemal AK, Division of Urology, UC San Diego Health System, San Diego, CA.: BJU Int 2013; 112(4):E290-4. doi:10.1111/bju.12167. [Epub 2013 Jul 1].
Citation: Urologic oncology, Nov 2014, vol. 32, no. 8, p. 1348. (November 2014)
Author(s): See, William A
Abstract: To compare perioperative morbidity and oncological outcomes of robot-assisted laparoscopic radical cystectomy (RARC) to open RC (ORC) at a single institution. A retrospective analysis was performed on a consecutive series of patients undergoing RC (100 RARC and 100 ORC) at Wake Forest University with curative intent from 2006 until 2010. Complication data using the Clavien system were collected for 90 days postoperatively. Complications and other perioperative outcomes were compared between patient groups. Patients in both groups had comparable preoperative characteristics. The overall and major complication (Clavien ≥ 3) rates were lower for RARC patients at 35 vs 57% (P = 0.001) and 10 vs 22% (P = 0.019), respectively. There were no significant differences between groups for pathological outcomes, including stage, number of nodes harvested or positive margin rates. Our data suggest that patients undergoing RARC have perioperative oncological outcomes comparable with ORC, with fewer overall or major complications. Definitive claims about comparative outcomes with RARC require results from larger, randomised controlled trials. Copyright © 2014 Elsevier Inc. All rights reserved.
Source: Medline

Title: Perioperative complications and oncological safety of robot-assisted (RARC) vs. open radical cystectomy (ORC).
Citation: Urologic oncology, Oct 2014, vol. 32, no. 7, p. 966-974 (October 2014)
Author(s): Niegisch, Günter, Albers, Peter, Rabenalt, Robert

Abstract: To assess the surgical and oncological outcome of robot-assisted radical cystectomy (RARC) compared with open radical cystectomy (ORC). Clinical data of 64 patients undergoing RARC between August 2010 and August 2013 were prospectively documented and retrospectively compared with 79 patients undergoing ORC between August 2008 and August 2013 at a single academic institution. Perioperative results, surgical margins status, and nodal yield after RARC and ORC were compared using Mann-Whitney U test (continuous variables) and chi-square test (categorical variables). Additional age-stratified analysis was performed in elderly patients (≥75 y). To avoid inference errors by multiple testing, P-values were adjusted using Bonferroni's correction. Baseline characteristics of both cohorts were balanced. RARC patients had significantly less blood loss (RARC: 300 [interquartile

range {IQR}: 200-500]ml; perioperative transfusion rate: 0 [IQR: 0-2] red packed blood cells [RPBCs]; ORC: 800 [IQR: 500-1200]ml, P<0.01; transfusion rate: 3 [IQR: 2-4] RPBCs, P<0.01), and hospital stay of RARC patients was reduced by 20% (RARC: 13 [IQR: 9-17]d, ORC: 16 [IQR: 13-21]d, P< 0.01). A total of 55 patients who underwent RARC and 59 patients who underwent ORC were eligible for analysis of oncological surrogates "surgical margin status" and "lymph-node yield" as well as for survival data. No differences between patients undergoing RARC or ORC were observed. In elderly patients (≥75 y; RARC: 17 patients, ORC: 28 patients), decreased intraoperative blood loss (RARC: 300 [IQR: 100-475]ml; ORC: 800 [IQR: 400-1300]ml, P<0.01) and lower transfusion rate (RARC: 0 [IQR: 0-1] RPBCs; ORC: 4 [IQR: 2-5] RPBCs, P<0.01) were observed in the robotic group. Major limitations of this study are the retrospective study design and a potential selection bias. RARC provides significant advantages compared with ORC regarding blood loss and postoperative recovery, whereas surgical and oncological outcomes are not different.

Source: Medline

Title: Propensity-matched comparison of morbidity and costs of open and robot-assisted radical cystectomies: a contemporary population-based analysis in the United States.
Citation: European urology, Sep 2014, vol. 66, no. 3, p. 569-576 (September 2014)
Author(s): Leow, Jeffrey J, Reese, Stephen W, Jiang, Wei, Lipsitz, Stuart R, Bellmunt, Joaquim, Trinh, Quoc-Dien, Chung, Benjamin I, Kibel, Adam S, Chang, Steven L
Abstract: Radical cystectomy (RC) is a morbid procedure associated with high costs. Limited population-based data exist on the complication profile and costs of robot-assisted RC (RARC) compared with open RC (ORC). To evaluate morbidity and cost differences between ORC and RARC. We conducted a population-based, retrospective cohort study of patients who underwent RC at 279 hospitals across the United States between 2004 and 2010. Multivariable logistic and median regression was performed to evaluate 90-d mortality, postoperative complications (Clavien classification), readmission rates, length of stay (LOS), and direct costs. To reduce selection bias, we used propensity weighting with survey weighting to obtain nationally representative estimates. The final weighted cohort included 34 672 ORC and 2101 RARC patients. RARC use increased from 0.6% in 2004 to 12.8% in 2010. Major complication rates (Clavien grade ≥ 3; 17.0% vs 19.8%, p = 0.2) were similar between ORC and RARC (odds ratio [OR]: 1.32; p = 0.42). RARC had 46% decreased odds of minor complications (Clavien grade 1-2; OR: 0.54; p = 0.03). RARC had $4326 higher adjusted 90-d median direct costs (p = 0.004). Although RARC had a significantly shorter LOS (11.8 d vs 10.2 d; p = 0.008), no significant differences in room and board costs existed (p = 0.20). Supply costs for RARC were significantly higher ($6041 vs $3638; p < 0.0001). Morbidity and cost differences were not present among the highest-volume surgeons (≥ 7 cases per year) and hospitals (≥ 19 cases per year). Limitations include use of an administrative database and lack of oncologic characteristics. The use of RARC has increased

between 2004 and 2010. Compared with ORC, RARC was associated with decreased odds of minor but not major complications and with increased expenditures attributed primarily to higher supply costs. Centralization of ORC and RARC to high-volume providers may minimize these morbidity and cost differences. Using a US population-based cohort, we found that robotic surgery for bladder cancer decreased minor complications, had no impact on major complications and was more costly than open surgery.
Source: Medline

Title: Open versus totally intracorporeal robot-assisted radical cystectomy, bilateral extended pelvic lymph node dissection and studer urinary diversion for bladder cancer
Citation: Journal of Endourology, September 2014, vol./is. 28/(A71), 0892-7790 (September 2014)
Author(s): Balbay M.D., Canda A.E., Gok B., Akbulut Z., Altinova S., Atmaca A.F.
Language: English
Abstract: INTRODUCTION AND OBJECTIVES: To compare open versus totally intracorporeal robotic-assisted radical cystectomy (RARC), bilateral extended pelvic lymph node dissection (BEPLND) and Studer urinary diversion in bladder cancer patients. METHODS: Retrospective comparison of open (n = 42) versus totally intracorporeal (n = 32) RARC, BEPLND and Studer urinary diversion was made. RESULTS: Patient demographics and pT stages were similar. Positive surgicalmargin rateswere 2.4%(open) and 6.3%(robotic) (p > 0.05). Mean estimated blood loss was significantly lower in robotic (412.5 +/- 208.3mL) versus open (1314.3 +/- 987.1mL, p = 0.000) group. More patients underwent bilateral neurovascular bundle (NVB) sparing surgery (93.7% versus 64.3%, p = 0.004) and BEPLND (100% versus 71.4%, p = 0.001) in robotic group. Significantly higher mean lymph node (LN) yield was detected in robotic group (25.4 +/- 9.7 versus 17.2+/- 13.5, p = 0.005). Following the exclusion of patients with standard pelvic LN dissection in open group, higher mean LN yield rate was detected in robotic group (25.4 +/- 9.7 versus 20.4 +/- 14.6, p = 0.118). Number of postoperative readmissions due tominor complications was significantly lower in robotic group (n =0 versus n= 7, p = 0.017). Minor and major complications and readmission rates due to major complications during perioperative period (0-30 days) and postoperative 31-90 days were similar. Although not significant, better outcomes of day-time continence with no pad use (robotic = 84.6% versus open = 75%, p > 0.05) and severe day-time incontinence (robotic = 8.3% versus open = 16.6%, p > 0.05) were detected in robotic group. Postoperative mean IIEF scores were similar (p > 0.05). CONCLUSIONS: Decreased blood loss, better preserving NVBs and decreased hospital readmissions due to minor complications seem to be advantages of RARC. Additionally, robotic approach seems to carry better trends related with the outcomes of day- time continence and LN yield.
Publication Type: Journal: Conference Abstract
Source: EMBASE

Title: Robot assisted radical cystectomy and Intra corporeal ileal conduit-video demonstrating steps of the procedure
Citation: European Urology, Supplements, September 2014, vol./is. 13/3(52-53), 1569-9056 (September 2014)
Author(s): Thyavihally Y., Pednekar A., Dharmadhikari N., Gulavani N., Patil A., Pokharkar H., Rao H.
Language: English
Abstract: Introduction & Objectives: Minimally invasive surgical treatment for muscle invasive bladder cancer has gained popularity in recent times with potential benefit compared to traditional open radical cystectomy. Urinary diversion is usually done by extracorporeal method. We evaluated preoperative outcomes, feasibility and safety of intracorporeal ileal conduit (ICIC) in patients treated with robot-assisted radical cystectomy (RARC) and highlighting the salient steps of the procedure in the video segments. Material & Methods: Thirty patients underwent RARC and ileal urinary diversion at our institution from June 2012 to May 2014. Mean age was 59 years (47-78 years). Among these, 26 patients had ileal conduit urinary diversion and out of these patients, 18 were intracorporeal and 8 were extracorporeal urinary diversions. Out of 18 intracorporeal ileal conduit, 14 were male patients and 4 were female patients. Surgery was performed by using Da Vinci Si robotic surgical system (Intuitive Surgicals, USA). In brief surgical steps include, mild Trendlenberg position, isolation of 15 cms of ileum, restoring the bowel continuity by side to side stapled anastomosis, ureteric anastomosis by bricker's method (16 patients) or Wallace method (2 Patients), ureters were stented by infant feeding tube and stoma is created. Operative data and short-term outcomes were assessed. Results: Mean age of the patients was 62 (51-78) years; Mean operating time for ICIC was160 mts (110-200). There were no 30 day mortality and one patient of ICUD developed adhesive intestinal obstruction managed conservatively. Time to oral feeds was 24 hours and mean hospitalization was 9 days (7-15 days). One patient aged 78 years had pneumonia on 8th day treated with antibiotics. There were no incidence of intestinal anastomotic leak, urinary leak, ureteric stricture, stoma related complications in the group after mean follow up of 16 months (3-24). Conclusions: Robotic assisted laparoscopic radical cystectomy with intracorporeal ileal conduit has been reported with potential benefits compared to the traditional open method. With time robotic surgeons are becoming more familiar with intracorporeal urinary diversion especially ileal conduit. As show in our small series, this can be achieved safely with no increase in complications rates. However more number of patients with more data is necessary to confirm these findings.

Publication Type: Journal: Conference Abstract
Source: EMBASE

Title: Perioperative outcomes of neoadjuvant chemotherapy versus radical cystectomy in patients treated with robot-assisted radical cystectomy: Results from the International Robotic Cystectomy Consortium (IRCC)

Citation: European Urology, Supplements, September 2014, vol./is. 13/3(41-42), 1569-9056 (September 2014)
Author(s): Woods M., Syed J., Dibaj S., Field E., Khan A., Mottrie A., Weizer A., Wagner A., Hemal A., Scherr D., Schanne F., Gaboardi F., Wu G., Peabody J., Kaouk J., Palou Redorta J., Rha K.H., Richstone L., Menon M., Stockle M., Wiklund P., Dasgupta P., Grubb R., Khan M.S., Siemer S., Wilson T., Wilding G., Guru K., Pruthi R.
Language: English
Abstract: Introduction & Objectives: Neoadjuvant chemotherapy (NAC) in patients with muscle-invasive bladder cancer remains underutilized. Morbidity and mortality associated with NAC has been considered as one of the main obstacles. To compare perioperative outcomes between patients receiving NAC and those treated with Robot-assisted radical Cystectomy RARC alone. Material & Methods: Between 2004 and 2014, a total of 1247 patients who underwent RARC were enrolled in IRCC with completed data on chemotherapy. 179 patients (14.4%) had undergone NAC. Clinical, pathological and perioperative data up to their latest followup were assessed. Patients who were lost to follow-up were censored at the excluded. Perioperative outcomes such as operative time, hospital stay and complications, overall (OS), cancer specific (CS) and recurrence-free survivals (RFS) were the primary outcomes and plotted using the Kaplan Meir Survival. Univariate and multivariate analyses were performed to identify prognostic factors after NAC. Results: Overall, 179 (14.4%) patients received NAC. Patients who underwent NAC had higher ASA score (51 vs. 45%), tumor grade (93 vs. 86.7%). Meanwhile age and gender were similar. Conclusions: Neoadjuvant chemotherapy is associated with longer lymph node dissection times but not with higher morbidity or mortality. Use of neoadjuvant chemotherapy is encouraged in patients who undergo Robot-assisted radical cystectomy. (Table Presented).
Publication Type: Journal: Conference Abstract
Source: EMBASE

Title: Urinary diversion after radical cystectomy-our initial experience comparing outcomes of extracorporeal and intracorporeal technique
Citation: European Urology, Supplements, September 2014, vol./is. 13/3(40), 1569-9056 (September 2014)
Author(s): Thyavihally Y., Patil A., Dharmadhikari N., Gulavani N., Rao H., Pednekar A.
Language: English
Abstract: Introduction & Objectives: Robotic assisted radical cystectomy for bladder cancer (RARC) has been reported with potential for improvement in peri-operative morbidity compared to the open approach and is gaining popularity. Yet, the concomitant urinary diversion is typically performed extracorporeally at most centers, primarily because intracorporeal diversion is technically complex and type of urinary diversion contributes to majority of complications. We report our initial experience and compare outcomes of intracorporeal urinary diversion (ICUD) to extracorporeal urinary diversion (ECUD) techniques done in our institute by the author. Material & Methods: We analyzed the prospectively collected data of 30 patients who

underwent RARC and ileal urinary diversion at our institution from June 2012 to May 2014. Mean age was 59 years (47-78 years). There were 24 male patients and 6 female patients. Twenty patients had ICUD out of which ileal conduit was done in 18 patients (14 males, 4 females) and studers ileal orthotopic neobladder was done in 2 male patients. Ten patients underwent ECUD out of which ileal conduit was done in 8 patients (6 males, 2 females) and studers ileal orthotopic neobladder was done in 2 male patients. Operative data and short-term outcomes between the two groups were assessed. Results: Mean age of ICUD group was 60 years and ECUD group was 62 years and there was no significant differences were noted between the groups in terms of patient age, BMI, performance status, prior surgery, or pathologic stage. Mean operating time for ICUD was160 mts (110-200) which was longer than ECUD group - 110 mts (90- 180) (p=0.04). There were no 30 day mortality and one patient of ECUD had 90 day mortality due to recurrent intestinal obstruction. One patient of ICUD developed adhesive intestinal obstruction managed conservatively and another patient aged 78 years had pneumonia on 8th day treated with antibiotics. Time to oral feeds was better with ICUD of 24 hours compared to 72 hours in ECUD. Requirement of pain medications, early ambulance, tolerance to oral feeds was better ICUD group. There were no incidence of intestinal anastomotic leak, urinary leak, ureteric stricture in either group. One patient of ECUD had stomal hernia after 6 months which was repaired laparoscopically. Conclusions: Urinary diversion after RARC is a significant contributor to complications. Complication rates were similar in patients who had whether ICUD or ECUD and also there were no increase complications in neobladder patients in our series which is comparable to literature. Robot-assisted intracorporeal urinary diversion can be accomplished safely with acceptable operative times even during early experience. Larger study with more patients and longer follow up will be required draw further conclusion.
Publication Type: Journal: Conference Abstract
Source: EMBASE

Title: Setting up a new robot assisted radical cystectomy service
Citation: European Urology, Supplements, September 2014, vol./is. 13/3(31), 1569-9056 (September 2014)
Author(s): Athanasiadis G., Soares R., Swinn M., Perry M., Jones C., Patil K.
Language: English
Abstract: Introduction & Objectives: Radical cystectomy is the treatment of choice for muscle invasive bladder cancer in fit patients. However, it is associated with significant morbidity and mortality of 48% and 4.2% respectively at 90 days. Median length of stay in UK is 13 days. A carefully designed service combining minimally invasive surgery with an Enhanced Recovery Programme may reduce length of stay, complications and mortality. We describe our experience in setting up and implementing such a service. Material & Methods: A new regional robot assisted radical cystectomy service started in April 2013. Between April 2013 and June 2014, 23 patients (19 men and 4 women), of average age 72 years old (range: 56-81) and median ASA grade 2 (range: 1-3), underwent robot assisted radical cystectomy with extended pelvic lymph node dissection. 21 of the patients had ileal conduit and 2 orthotopic neobladder formation. As part of our Enhanced Recovery Programme,

patient education, pre-operative carbohydrate drinks, spinal analgesia, goal-directed fluid therapy, early feeding (with nutritional supplementation) and intensive early mobilisation were applied and opioid analgesics and nasogastric tube insertion were avoided. Results: Median surgical time was 6.5 h (range: 5 h 30 min-8 h 53 min), median blood loss was 223 ml (range: 30-500 ml) and median length of stay was 8 days (range: 5-29 days). One death was recorded (Clavien 5), one patient underwent laparotomy (Clavien 3b), one patient required readmission for transfusion and drainage of pelvic haematoma (Clavien 3a) and one more patient was transfused (Clavien 2). There were no other significant complications. Conclusions: A well designed Enhanced Recovery Programme in combination with minimally invasive surgery can dramatically improve complications and length of stay compared to the national standards, even from its beginning. Long term results are awaited.
Publication Type: Journal: Conference Abstract
Source: EMBASE

Title: Oncological outcomes following robot-assisted radical cystectomy
Citation: European Urology, Supplements, September 2014, vol./is. 13/3(23), 1569-9056 (September 2014)
Author(s): Goldstraw M., Zacharakis E., Ashwin S., Cathcart P., Nathan S., Briggs T., Kelly J.
Language: English
Abstract: Introduction & Objectives: Radical cystectomy is the gold standard treatment for muscle-invasive bladder cancer and offers survival advantages for high risk superficial disease. Neoadjuvant chemotherapy may also offer a survival advantage in suitably selected patients. At present, the long-term oncological outcomes for robot-assisted radical cystectomy (RARC) are unclear. We report the oncological outcomes of large series from a single centre performing this operation since July 2011. Furthermore, a significant proportion (42%) of this group have undergone neoadjuvant chemotherapy. Material & Methods: Prospective data collection was performed over the period July 2011-June 2014 using our Uro-oncology database with retrospective analysis. Classification of surgical complications was undertaken using the Clavien grading system. Statistical analysis was performed using Stata© software and Kaplan Meyer curves for Tstage undertaken to report disease-specific survival and recurrencefree survival. Results: 73 consecutive RARC patients with a median age of 66 (30-86) were included for analysis with 48 (66%) intracorporeal ileal conduits and 25 (34%) neobladders. Median follow-up was 11.8 months (3-32). Neobladder patients had a lower BMI at 23 (22-29) in comparison to 27 (23-32) for ileal conduits. Male to female ratio was 3:1.Common complications included blood transfusion- 9.6%, ileus- 14.0% and pelvic collection- 6.8%. 30-day readmission rate was 8.0%.Overall 33 patients (42%) received neoadjuvant chemotherapy and 13 were downstaged to T0 at cystectomy. 32.4% of patients were stage pT3 or higher disease or were N1. Cancer specific survival was calculated at 6.2%, 8.7% and 18.1% at 180, 360 and 720 days respectively. Disease-free survival was 16.5%, 21.5% and 21.5% at 180, 360 and 720 days.71% of patients who recurred had detectable disease within 6 months.

Furthermore, of the patients who progress to death 86% progress within 12 months from surgery. Conclusions: Survival data appears to correlate directly with T-stage and those patients who are >T3 or N1 do particularly badly. The impact of neoadjuvant chemotherapy appears to significantly downstage a number of patients but some patients do progress during this 12 week treatment course. Identifying which patients will benefit most from this treatment is a critical next step to move forward.
Publication Type: Journal: Conference Abstract
Source: EMBASE

Title: Health related quality of life outcomes following robot-assisted radical cystectomy
Citation: European Urology, Supplements, September 2014, vol./is. 13/3(23), 1569-9056 (September 2014)
Author(s): Goldstraw M., Sridhar A., Cathcart P., Briggs T., Nathan S., Kelly J.
Language: English
Abstract: Introduction & Objectives: The objectives of the study were to evaluate Quality of life (QoL) in patients with invasive bladder cancer who received an orthotopic neobladder or an ileal conduit following robot-assisted radical cystectomy (RARC). Material & Methods: The European Organization for Research and Treatment of Cancer QLQ-C30 and the QLQ-muscle-invasive bladder cancer module (QLQ BLM-30) questionnaire were administered to all patients undergoing RARC at a single institute. Study period included patients operated on between July 2011 to December 2013. Telephone reminders were sent out to non-responders at 4 weeks. Results: 73 patients, aged 30-86, underwent RARC and ileal conduit (n=48) or an orthotopic neobladder (n=25). Neobladder patients had a lower median age (55) compared to ileal conduits (67) and had a lower BMI at 23 (22-29) versus 27 (23-32) for ileal conduit. Patient response rates were good at 61% with a noticeable improvement in all domain scores for those>6 months follow-up in comparison to those with Overall quality of life was good with 73% of responders scoring >5 of 7 (neobladder = ileal conduit). Overall health scores reported 77% of neobladders and 64% of ileal conduits scoring >5 of 7 reflecting the healthier population group in the former. Patient perception of body image was markedly different in the two groups with 90% of neobladders either "not at all" or "a little" dissatisfied with their body in comparison to 58% of ileal conduits. This figure was mirrored by the question of whether they felt physically less attractive as a result of their illness (90% vs 66%). None of the patients undergoing ileal conduit urinary diversion reported interest in sex as opposed to 50% of the neobladders reporting either "quite a bit" or "very interested". Unfortunately this transferred poorly to sexual activity with 24% reporting "quite a bit" or "very much". Conclusions: It appears that patients undergoing ileal conduit or neobladder have a good functional recovery at >6 months following RARC. Overall quality of life scores are similar in the two groups although neobladder patients appear to have a higher overall health score, perhaps reflecting the healthier patient cohort. Patient perception of body image is markedly different in the two groups with neobladder patients scoring highly. Unfortunately, sexual activity appears to be low.

Publication Type: Journal: Conference Abstract
Source: EMBASE

Title: Early and late complications after robot-assisted radical cystectomy with totally intracorporeal urinary diversion
Citation: European Urology, Supplements, September 2014, vol./is. 13/3(18-19), 1569-9056 (September 2014)
Author(s): Hosseini A., Adding C., Laurin O., Wiklund P.
Language: English
Abstract: Introduction & Objectives: During the last years more centers performed radical cystectomy robotically. The aim of this report is to describe our results for early- and late complications after robotassisted radical cystectomy (RARC) with totally intracorporeal urinary diversion. Material & Methods: Between December 2003 and June 2013, a total of 164 bladder cancer patients (127 male, 37 female) underwent RARC with totally intracorporeal urinary diversion. Mean age was 64 years (range 37-87). Neoadjuvant Cisplatine-based chemotherapy was administrated in 33% of the patients. 29 patients (20%) had BCG treatment prior surgery. A total of 86 (52%) patients received a continent urinary diversion with intracorporeal neobladder formation and 78 (48%) an ileal conduit. Conversion to open surgery was necessary in 5 patients. Results: Patients with Ileal conduit had more frequent early complications with higher Median operating time was 382 minutes (range 177-760). On surgical pathology, 48% of patients had pT1 or less disease, 25% had pT2, and 27% had pT3/PT4 tumor. Patients who had neoadjuvant chemotherapy were found to have pT0 disease in 49%. The mean number of lymph nodes removed was 21 (range 0-60). 23% of patients had lymph node positive disease. Positive surgical margins occurred in 6 cases (3.6%). Median follow-up was 18 months (range 3-117 months). We recorded a total of 102 early complications (30 days) were recorded of which 22 patients (13%) had Clavien grade 3 or higher. Three patients (2%) died within 90 days after surgery, one from pulmonary embolism and two from cardiac arrest. Clavien grade than patients with neobladder; however, the difference was not statistically significant. Whereas patients with orthotopic neobladder had more late complications than the patients with ileal conduit ($p<0.05$). We found no relation between neoadjuvant treatment and history of BCG-treatment in relation to postoperative early and late complications. Conclusions: RARC with intracorporeal urinary diversion is a complex surgical procedure with post-operative morbidity. However the majority of complications are low grade (Clavian <2) and comparison with open cystectomy series will have to await further studies. A history of BCG- and neoadjuvant treatment in these patients was not associated with a higher complication rate.
Publication Type: Journal: Conference Abstract
Source: EMBASE

Title: Robot-assisted en-bloc radical cystectomy with nephroureterectomy and intracorporal urinary diversion by seven patients with muscle-invasive bladder cancer and upper urinary tract urothelial cell carcinoma. Single-center experience

Citation: European Urology, Supplements, September 2014, vol./is. 13/3(6), 1569-9056 (September 2014)
Author(s): Krude J., Alexandrov A., Lund P., Hach C., Goell A.
Language: English
Abstract: Introduction & Objectives: In this video we describe step-by-step our technique of robot-assisted en-bloc radical cystectomy with nephroureterectomy and intracorporal urinary diversion in seven patients with the diagnosis of muscle-invasive bladder cancer and synchronius upper urinary tract urothelial cell carcinoma. We also show important bench-marks of this procedure. This video shows in detail all steps of the procedure from port placement (seven-port transperitoneal approach) over the ablative steps (bladder and kidney resection and pelvic lymph node dissection) to the fully intracorporal robot-assisted reconstruction. Material & Methods: After informed consent, we assessed 7 patients undergoing an en-bloc radical cystectomy and nephroureterectomy at Alfried Krupp Hospital, Germany. All procedures were performed by one surgeon. We primarily assessed surgery and console duration, conversion rate, blood loss, intraoperative transfusion, and resection status. Secondary endpoints were postoperative transfusions as well as intra- and postoperative complications. Results: Three of the patients were male. Median age was 75.14 years (64-84), the mean BMI was 27.98 kg/m² (22-34). Two of the patients were ASA 2, four ASA 3 and one ASA 4. The indication for an en-bloc radical cystectomy and nephroureterectomy was diagnosis of a simultaneous transitional cell cancer of the lower and upper urinary tract in three patients. The other four patients had a muscle-invasive bladder cancer and a functionless kidney. Urinary diversion was reconstructed as intracorporal ureterocutaneostomy in six and as extracorporal ileum conduit in one patient. Surgery lasted 296.85 min, thereof 199.71 min console time on average. There was no need of a conversion to open surgery. The mean blood loss was 238 ml and none of the patients required blood transfusions. Resection margins were tumor-free in six cases. In the patient with positive resection margins the tumor stage was pT4a. Postoperative complications occurred in two of the patients: paralytic Ileus (Clavien-Dindo class 1 (CDC 1) in one patient and port hernia (CDC 3b) in the other patient. Conclusions: Robot-assisted en-bloc radical cystectomy and nephroureterectomy could be performed with acceptable surgery durations with a high intraoperatively and postoperatively safety. Further surgeries have to be performed to evaluate functional and oncologic results.
Publication Type: Journal: Conference Abstract
Source: EMBASE

Title: Survival outcomes after robot-assisted radical cystectomy: Results from the international robotic cystectomy
Citation: European Urology, Supplements, September 2014, vol./is. 13/3(5), 1569-9056 (September 2014)
Author(s): Raza J., Dibaj S., Wilding G., Field E., Wing J., Hosseini A., Kibel A., Mottrie A., Weizer A., Wagner A., Hemal A., Scherr D., Schanne F., Gaboardi F., Wu G., Peabody J., Kaouk J., Palou Redorta J., Rha K.H., Richstone L., Balbay M.D.,

Menon M., Hayn M., Stockle M., Woods M., Wiklund P., Dasgupta P., Pruthi R., Grubb R., Khan M.S., Siemer S., Wilson T., Guru K.
Language: English
Abstract: Introduction & Objectives: Data on the long-term oncological outcomes in patients undergoing robot-assisted radical cystectomy (RARC) is limited and mostly based on single institutional series. We report the clinical outcomes and associated prognostic factors in patients who underwent RARC over 5 years ago. Material & Methods: In the IRCC database, 1586 patients underwent RARC for bladder cancer between 2004 and 2013. Only 315 patients (20%) had undergone surgery over five or more years ago. Clinical and pathological data at the time of the latest follow-up were collected. Patients with<60 months of follow up were excluded from the analysis. Recurrence free survival (RFS), cancer specific survival (CSS) and overall survival (OS) were the outcomes of interest and plotted using the Kaplan Meier Survival. Univariable and multivariable analyses were performed to identify factors associated with outcomes of interest. Results: 315 patients were included in the evaluation. 92 patients were alive at the time of the analysis. Mean follow-up of patients alive was 75 months. Mean age was 69 years, while 80% were men. 48% patients had pathological non organ-confined disease. Soft tissue positive margins was 6%; median LNY was 16 with 29% positive lymph nodes. The median time to death and cancer specific death was 14 and 13 months respectively. The RFS, CSS and OS were 56%, 61% and 39% respectively. On multivariable analysis, ASA, non-organ confined disease and LN positive disease were associated with poorer RFS (HR1.43, 3.07 and 1.12 respectively), while age non-organ confined disease and positive lymph nodes affected both CSS and OS. Conclusions: The largest multi-institutional cohort of robot-assisted radical cystectomy present acceptable survival outcomes.
Publication Type: Journal: Conference Abstract
Source: EMBASE

Title: Propensity-matched comparison of morbidity and costs of open and robot-assisted radical cystectomies: A contemporary population-based analysis in the United States
Citation: European Urology, September 2014, vol./is. 66/3(569-576), 0302-2838;1873-7560 (September 2014)
Author(s): Leow J.J., Reese S.W., Jiang W., Lipsitz S.R., Bellmunt J., Trinh Q.-D., Chung B.I., Kibel A.S., Chang S.L.
Language: English
Abstract: Background Radical cystectomy (RC) is a morbid procedure associated with high costs. Limited population-based data exist on the complication profile and costs of robot-assisted RC (RARC) compared with open RC (ORC). Objective To evaluate morbidity and cost differences between ORC and RARC. Design, setting, and participants We conducted a population-based, retrospective cohort study of patients who underwent RC at 279 hospitals across the United States between 2004 and 2010. Outcome measurements and statistical analysis Multivariable logistic and median regression was performed to evaluate 90-d mortality, postoperative

complications (Clavien classification), readmission rates, length of stay (LOS), and direct costs. To reduce selection bias, we used propensity weighting with survey weighting to obtain nationally representative estimates. Results and limitations The final weighted cohort included 34 672 ORC and 2101 RARC patients. RARC use increased from 0.6% in 2004 to 12.8% in 2010. Major complication rates (Clavien grade >3; 17.0% vs 19.8%, p = 0.2) were similar between ORC and RARC (odds ratio [OR]: 1.32; p = 0.42). RARC had 46% decreased odds of minor complications (Clavien grade 1-2; OR: 0.54; p = 0.03). RARC had $4326 higher adjusted 90-d median direct costs (p = 0.004). Although RARC had a significantly shorter LOS (11.8 d vs 10.2 d; p = 0.008), no significant differences in room and board costs existed (p = 0.20). Supply costs for RARC were significantly higher ($6041 vs $3638; p < 0.0001). Morbidity and cost differences were not present among the highest-volume surgeons (>7 cases per year) and hospitals (>19 cases per year). Limitations include use of an administrative database and lack of oncologic characteristics. Conclusions The use of RARC has increased between 2004 and 2010. Compared with ORC, RARC was associated with decreased odds of minor but not major complications and with increased expenditures attributed primarily to higher supply costs. Centralization of ORC and RARC to high-volume providers may minimize these morbidity and cost differences. Patient summary Using a US population-based cohort, we found that robotic surgery for bladder cancer decreased minor complications, had no impact on major complications and was more costly than open surgery. © 2014 European Association of Urology.
Publication Type: Journal: Article
Source: EMBASE

Title: External validation of preoperative and postoperative nomograms for prediction of cancer-specific survival, overall survival and recurrence after robot-assisted radical cystectomy for urothelial carcinoma of the bladder
Citation: BJU International, August 2014, vol./is. 114/2(253-260), 1464-4096;1464-410X (August 2014)
Author(s): Al-Daghmin A., English S., Kauffman E.C., Din R., Khan A., Syed J.R., Sztorc J., Mehedint D., Sharif M., Shi Y., Wilding G., Guru K.A.
Language: English
Abstract: Objective To externally validate currently available bladder cancer nomograms for prediction of all-cause survival (ACS), cancer-specific survival (CSS), other-cause mortality (OCM) and progression-free survival (PFS). Patients and Methods Retrospective analysis of a prospectively maintained database of 282 patients who underwent robot-assisted radical cystectomy (RARC) at a single institution was performed. The Bladder Cancer Research Consortium (BCRC), International Bladder Cancer Nomogram Consortium (IBCNC) and Lughezzani nomograms were used for external validation, and evaluation for accuracy at predicting oncological outcomes. The 2- and 5-year oncological outcomes were compared, and nomogram performance was evaluated through measurement of the concordance (c-index) between nomogram-derived predicted oncological outcomes and observed oncological outcomes. Results The median (range) patient age was 70

(36-90) years. At a mean follow-up of 20 months, local or distant disease recurrence developed in 30% of patients. With an overall mortality rate of 33%, 17% died from bladder cancer. The actuarial 2- and 5-year PFS after RARC was 62% (95% confidence interval [CI] 54-68) and 55% (95% CI 46-63), respectively. The actuarial 2- and 5-year ACS was 66% (95% CI 59-72) and 47% (95% CI 37-55), respectively, and the 2- and 5-year CSS was 81% (95% CI 74-86) and 67% (95% CI 57-76), respectively. The PFS c-index for IBCNC was 0.70 at 5 years, and for BCRC was 0.77 at both the 2 and 5 years. The accuracy of ACS and CSS prediction was evaluated using the BCRC and Lughezzani nomograms. Using the BCRC nomogram, c-indices of for 2- and 5-year ACS were each 0.73 and c-indices for 2- and 5-year CSS were 0.70 each. The performance of Lughezzani nomogram for 5-year ACS, cancer-specific mortality and OCM were 0.73, 0.72 and 0.40, respectively. The BCRC nomogram prediction of advanced pathological stage and lymph node metastasis was modest, with c-indices of 0.66 and 0.61, respectively. Conclusions Bladder cancer nomograms available from the current open RC literature adequately predict ACS, CSS and PFS after RARC. However, prediction of advanced tumour stage and lymph node metastasis was modest and the Lughezzani nomogram failed to predict OCM. © 2013 The Authors. BJU International © 2013 BJU International.
Publication Type: Journal: Article
Source: EMBASE

Title: National trends in the utilization of robotic-assisted radical cystectomy: an analysis using the Nationwide Inpatient Sample.
Citation: Urologic oncology, Aug 2014, vol. 32, no. 6, p. 785-790 (August 2014)
Author(s): Monn, M Francesca, Cary, K Clint, Kaimakliotis, Hristos Z, Flack, Chandra K, Koch, Michael O
Abstract: To determine temporal and regional trends in utilization of robotic-assisted radical cystectomy (RARC) in the United States and to explore factors associated with utilization of robotic assistance. Using 2009 to 2011 data from the Nationwide Inpatient Sample, we identified radical cystectomy cases that were performed using either open or robotic assistance and applied Nationwide Inpatient Sample discharge weights to determine national incidence. Univariable and multivariable logistic regressions were performed to assess regional trends and characteristics associated with having RARC. Descriptive analysis was performed using the chi-square test, the Student t test, and the Mann-Whitney U test. Of the 29,719 radical cystectomy patients, 3,733 were RARC (12.6%). Although there was no change in the proportion of RARC performed annually (P = 0.702). Length of stay was 1 day longer for open cystectomy than RARC (P<0.001). On multivariate regression, patients whose primary payer was Medicaid were less likely than private insurance patients to undergo RARC (odds ratio = 0.60, P = 0.074). Additionally, patients in the south were at 50% reduced odds of undergoing RARC (odds ratio = 0.49, P = 0.044). Median hospital costs were $5,000 greater for RARC (P<0.001). Regional variation in utilization should be monitored to ensure equal access to new technology and to assess potential overuse of new technology. Although RARC is associated with

higher median hospital costs, further studies to assess its benefits are warranted.

Source: Medline

Title: External validation of preoperative and postoperative nomograms for prediction of cancer-specific survival, overall survival and recurrence after robot-assisted radical cystectomy for urothelial carcinoma of the bladder.

Citation: BJU international, Aug 2014, vol. 114, no. 2, p. 253-260 (August 2014)
Author(s): Al-Daghmin, Ali, English, Stephen, Kauffman, Eric C, Din, Rakeeba, Khan, Aabroo, Syed, Johar R, Sztorc, Jenna, Mehedint, Diana, Sharif, Mohammad, Shi, Yi, Wilding, Gregory, Guru, Khurshid A
Abstract: To externally validate currently available bladder cancer nomograms for prediction of all-cause survival (ACS), cancer-specific survival (CSS), other-cause mortality (OCM) and progression-free survival (PFS). Retrospective analysis of a prospectively maintained database of 282 patients who underwent robot-assisted radical cystectomy (RARC) at a single institution was performed. The Bladder Cancer Research Consortium (BCRC), International Bladder Cancer Nomogram Consortium (IBCNC) and Lughezzani nomograms were used for external validation, and evaluation for accuracy at predicting oncological outcomes. The 2- and 5-year oncological outcomes were compared, and nomogram performance was evaluated through measurement of the concordance (c-index) between nomogram-derived predicted oncological outcomes and observed oncological outcomes. The median (range) patient age was 70 (36-90) years. At a mean follow-up of 20 months, local or distant disease recurrence developed in 30% of patients. With an overall mortality rate of 33%, 17% died from bladder cancer. The actuarial 2- and 5-year PFS after RARC was 62% (95% confidence interval [CI] 54-68) and 55% (95% CI 46-63), respectively. The actuarial 2- and 5-year ACS was 66% (95% CI 59-72) and 47% (95% CI 37-55), respectively, and the 2- and 5-year CSS was 81% (95% CI 74-86) and 67% (95% CI 57-76), respectively. The PFS c-index for IBCNC was 0.70 at 5 years, and for BCRC was 0.77 at both the 2 and 5 years. The accuracy of ACS and CSS prediction was evaluated using the BCRC and Lughezzani nomograms. Using the BCRC nomogram, c-indices of for 2- and 5-year ACS were each 0.73 and c-indices for 2- and 5-year CSS were 0.70 each. The performance of Lughezzani nomogram for 5-year ACS, cancer-specific mortality and OCM were 0.73, 0.72 and 0.40, respectively. The BCRC nomogram prediction of advanced pathological stage and lymph node metastasis was modest, with c-indices of 0.66 and 0.61, respectively. Bladder cancer nomograms available from the current open RC literature adequately predict ACS, CSS and PFS after RARC. However, prediction of advanced tumour stage and lymph node metastasis was modest and the Lughezzani nomogram failed to predict OCM. © 2013 The Authors. BJU International © 2013 BJU International.
Source: Medline

Title: Comparison of initial experiences of robot-assisted radical cystectomy with those of laparoscopic for bladder cancer.
Citation: Innovations (Philadelphia, Pa.), Jul 2014, vol. 9, no. 4, p. 322-326 (2014 Jul-Aug)
Author(s): Teishima, Jun, Hieda, Keisuke, Inoue, Shogo, Goto, Keisuke, Ikeda, Kenichiro, Ohara, Shinya, Kobayashi, Kanao, Kajiwara, Mitsuru, Matsubara, Akio
Abstract: The aim of the present study was to evaluate perioperative outcomes in initial experiences of robot-assisted laparoscopic radical cystectomy (RARC) in comparison with those of laparoscopic radical cystectomy (LRC) for muscle-invasive or high-risk non-muscle-invasive bladder cancer. We performed RARC on six patients with muscle-invasive or high-risk non-muscle-invasive bladder cancer starting in October 2011. During the same period, another five patients underwent LRC. Perioperative outcomes in initial experiences of RARC were elucidated by comparing them with those of LRC. Robot-assisted procedures were completed in all cases without conversion to open surgery. The median time of pneumoperitoneum was 252 minutes, and the median blood loss was 340 mL. No severe complications were observed. Perioperative outcomes did not significantly differ between RARC and LRC. Although two cases of troubles in uretero-conduit anastomosis sites were observed after LRC, no patients experienced postoperative complication related to urinary diversion after RARC. Our data indicate that RARC is an acceptable option even in the initial period, and it may become one of the most favorable procedures for treatment of muscle-invasive bladder cancer in the near future, although more tests and longer follow-ups are required to confirm its effectiveness and safety.
Source: Medline

Title: Efficacy of robot-assisted radical cystectomy (RARC) in advanced bladder cancer: results from the International Radical Cystectomy Consortium (IRCC).
Citation: BJU international, Jul 2014, vol. 114, no. 1, p. 98-103 (July 2014)
Author(s): Al-Daghmin, Ali, Kauffman, Eric C, Shi, Yi, Badani, Ketan, Balbay, M Derya, Canda, Erdem, Dasgupta, Prokar, Ghavamian, Reza, Grubb, Robert, Hemal, Ashok, Kaouk, Jihad, Kibel, Adam S, Maatman, Thomas, Menon, Mani, Mottrie, Alex, Nepple, Kenneth, Pattaras, John G, Peabody, James O, Poulakis, Vassilis, Pruthi, Raj, Palou Redorta, Juan, Rha, Koon-Ho, Richstone, Lee, Schanne, Francis, Scherr, Douglas S, Siemer, Stefan, Stöckle, Michael, Wallen, Eric M, Weizer, Alon, Wiklund, Peter, Wilson, Timothy, Wilding, Gregory, Woods, Michael, Guru, Khurshid A
Abstract: To characterise the surgical feasibility and outcomes of robot-assisted radical cystectomy (RARC) for pathological T4 bladder cancer. Retrospective evaluation of a prospectively maintained International Radical Cystectomy Consortium database was conducted for 1118 patients who underwent RARC between 2003 and 2012. We dichotomised patients based on pathological stage (≤pT3 vs pT4) and evaluated demographic, operative and pathological variables in relation to morbidity and mortality. In all, 1000 ≤pT3 and 118 pT4 patients were evaluated. The pT4 patients were older than the ≤pT3 patients (P = 0.001). The median operating time and blood loss were 386 min and 350 mL vs 396 min and 350

mL for p T4 and ≤pT3, respectively. The complication rate was similar (54% vs 58%; P = 0.64) among ≤pT3 and pT4 patients, respectively. The overall 30- and 90-day mortality rate was 0.4% and 1.8% vs 4.2% and 8.5% for ≤pT3 vs pT4 patients (P < 0.001), respectively. The body mass index (BMI), American Society of Anesthesiology score, length of hospital stay (LOS) >10 days, and 90-day readmission were significantly associated with complications in pT4 patients. Meanwhile, BMI, LOS >10 days, grade 3-5 complications, 90-day readmission, smoking, previous abdominal surgery and neoadjuvant chemotherapy were significantly associated with mortality in pT4 patients. On multivariate analysis, BMI was an independent predictor of complications in pT4 patients, but not for mortality. RARC for pT4 bladder cancer is surgically feasible but entails significant morbidity and mortality. BMI was independent predictor of complications in pT4 patients. © 2013 The Authors. BJU International © 2013 BJU International.
Source: Medline

Title: International radical cystectomy consortium: A way forward
Citation: Indian Journal of Urology, July 2014, vol./is. 30/3(314-317), 0970-1591;1998-3824 (July-September 2014)
Author(s): Raza S.J., Field E., Kibel A.S., Mottrie A., Weizer A.Z., Wagner A., Hemal A.K., Scherr D.S., Schanne F., Gaboardi F., Wu G., Peabody J.O., Koauk J., Redorta J.P., Pattaras J.G., Rha K.-H., Richstone L., Balbay M.D., Menon M., Hayn M., Stoeckle M., Wiklund P., Dasgupta P., Pruthi R., Ghavamian R., Khan S., Siemer S., Maatman T., Wilson T., Poulakis V., Wilding G., Guru K.A.
Language: English
Abstract: Robot-assisted radical cystectomy (RARC) is an emerging operative alternative to open surgery for the management of invasive bladder cancer. Studies from single institutions provide limited data due to the small number of patients. In order to better understand the related outcomes, a world-wide consortium was established in 2006 of patients undergoing RARC, called the International Robotic Cystectomy Consortium (IRCC). Thus far, the IRCC has reported its findings on various areas of operative interest and continues to expand its capacity to include other operative modalities and transform it into the International Radical Cystectomy Consortium. This article summarizes the findings of the IRCC and highlights the future direction of the consortium.
Publication Type: Journal: Conference Paper
Source: EMBASE
Full Text:
Available from *National Library of Medicine* in Indian Journal of Urology : IJU : Journal of the Urological Society of India

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Title: Robot-assisted radical cystectomy with intracorporeal neobladder diversion: The karolinska experience
Citation: Indian Journal of Urology, July 2014, vol./is. 30/3(307-313), 0970-1591;1998-3824 (July-September 2014)
Author(s): Collins J.W., Sooriakumaran P., Sanchez-Salas R., Ahonen R., Nyberg T., Wiklund N.P., Hosseini A.

Language: English
Abstract: Introduction: The aim of this report is to describe our surgical technique of totally intracorporeal robotic assisted radical cystectomy (RARC) with neobladder formation. Materials and Methods: Between December 2003 and March 2013, a total of 147 patients (118 male, 29 female) underwent totally intracorporeal RARC for urinary bladder cancer. We also performed a systematic search of Medline, Embase and PubMed databases using the terms RARC, robotic cystectomy, robot-assisted, totally intracorporeal RARC, intracorporeal neobladder, intracorporeal urinary diversion, oncological outcomes, functional outcomes, and complication rates. Results: The mean age of our patients was 64 years (range 37-87). On surgical pathology 47% had pT1 or less disease, 27% had pT2, 16% had pT3 and 10% had pT4. The mean number of lymph nodes removed was 21 (range 0-60). 24% of patients had lymph node positive dAQ1isease. Positive surgical margins occurred in 6 cases (4%). Mean follow-up was 31 months (range 4-115 months). Two patients (1.4%) died within 90 days of their operation. Using Kaplan-Meier analysis, overall survival and cancer specific survival at 60 months was 68% and 69.6%, respectively. 80 patients (54%) received a continent diversion with totally intracorporeal neobladder formation. In the neobladder subgroup median total operating time was 420 minutes (range 265-760). Daytime continence and satisfactory sexual function or potency at 12 months ranged between 70-90% in both men and women. Conclusions: Our experience with totally intracorporeal RARC demonstrates acceptable oncological and functional outcomes that suggest this is a viable alternative to open radical cystectomy.
Publication Type: Journal: Conference Paper
Source: EMBASE
Full Text:
Available from *National Library of Medicine* in Indian Journal of Urology : IJU : Journal of the Urological Society of India

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Title: Comparison of initial experiences of robot-assisted radical cystectomy with those of laparoscopic for bladder cancer

Citation: Innovations: Technology and Techniques in Cardiothoracic and Vascular Surgery, July 2014, vol./is. 9/4(322-326), 1556-9845;1559-0879 (July-August 2014)
Author(s): Teishima J., Hieda K., Inoue S., Goto K., Ikeda K., Ohara S., Kobayashi K., Kajiwara M., Matsubara A.
Language: English
Abstract: OBJECTIVE: The aim of the present study was to evaluate perioperative outcomes in initial experiences of robot-assisted laparoscopic radical cystectomy (RARC) in comparison with those of laparoscopic radical cystectomy (LRC) for muscle-invasive or high-risk non-muscle-invasive bladder cancer. METHODS: We performed RARC on six patients with muscle-invasive or high-risk non-muscle-invasive bladder cancer starting in October 2011. During the same period, another five patients underwent LRC. Perioperative outcomes in initial experiences of RARC were elucidated by comparing them with those of LRC. RESULTS: Robot-assisted procedures were completed in all cases without conversion to open surgery. The

median time of pneumoperitoneum was 252 minutes, and the median blood loss was 340 mL. No severe complications were observed. Perioperative outcomes did not significantly differ between RARC and LRC. Although two cases of troubles in uretero-conduit anastomosis sites were observed after LRC, no patients experienced postoperative complication related to urinary diversion after RARC. CONCLUSIONS: Our data indicate that RARC is an acceptable option even in the initial period, and it may become one of the most favorable procedures for treatment of muscle-invasive bladder cancer in the near future, although more tests and longer follow-ups are required to confirm its effectiveness and safety. Copyright © 2014 by the International Society for Minimally Invasive Cardiothoracic Surgery.
Publication Type: Journal: Article
Source: EMBASE

Title: Efficacy of robot-assisted radical cystectomy (RARC) in advanced bladder cancer: Results from the International Radical Cystectomy Consortium (IRCC)
Citation: BJU International, July 2014, vol./is. 114/1(98-103), 1464-4096;1464-410X (July 2014)
Author(s): Al-Daghmin A., Kauffman E.C., Shi Y., Badani K., Balbay M.D., Canda E., Dasgupta P., Ghavamian R., Grubb III R., Hemal A., Kaouk J., Kibel A.S., Maatman T., Menon M., Mottrie A., Nepple K., Pattaras J.G., Peabody J.O., Poulakis V., Pruthi R., Palou Redorta J., Rha K.-H., Richstone L., Schanne F., Scherr D.S., Siemer S., Stockle M., Wallen E.M., Weizer A., Wiklund P., Wilson T., Wilding G., Woods M., Guru K.A.
Language: English
Abstract: Objective To characterise the surgical feasibility and outcomes of robot-assisted radical cystectomy (RARC) for pathological T4 bladder cancer. Patients and Methods Retrospective evaluation of a prospectively maintained International Radical Cystectomy Consortium database was conducted for 1118 patients who underwent RARC between 2003 and 2012. We dichotomised patients based on pathological stage (<pT3 vs pT4) and evaluated demographic, operative and pathological variables in relation to morbidity and mortality. Results In all, 1000 <pT3 and 118 pT4 patients were evaluated. The pT4 patients were older than the <pT3 patients (P = 0.001). The median operating time and blood loss were 386amin and 350a mL vs 396amin and 350amL for p T4 and <pT3, respectively. The complication rate was similar (54% vs 58%; P = 0.64) among <pT3 and pT4 patients, respectively. The overall 30- and 90-day mortality rate was 0.4% and 1.8% vs 4.2% and 8.5% for <pT3 vs pT4 patients (P < 0.001), respectively. The body mass index (BMI), American Society of Anesthesiology score, length of hospital stay (LOS) >10 days, and 90-day readmission were significantly associated with complications in pT4 patients. Meanwhile, BMI, LOS >10 days, grade 3-5 complications, 90-day readmission, smoking, previous abdominal surgery and neoadjuvant chemotherapy were significantly associated with mortality in pT4 patients. On multivariate analysis, BMI was an independent predictor of complications in pT4 patients, but not for mortality. Conclusions RARC for pT4 bladder cancer is surgically feasible but entails significant morbidity and mortality. BMI was independent predictor of complications in pT4 patients. © 2013 BJU International.

Publication Type: Journal: Article
Source: EMBASE

Title: Health-related quality of life outcomes after robot-assisted and open radical cystectomy using a validated bladder-specific instrument: A multi-institutional study
Citation: Urology, June 2014, vol./is. 83/6(1300-1308), 0090-4295;1527-9995 (June 2014)
Author(s): Aboumohamed A.A., Raza S.J., Al-Daghmin A., Tallman C., Creighton T., Crossley H., Dailey S., Khan A., Din R., Mehedint D., Wang K., Shi Y., Sharif M., Wilding G., Weizer A., Guru K.A.
Language: English

Abstract: Objective To evaluate health-related quality of life (HRQL) using validated bladder-specific Bladder Cancer Index (BCI) and European Organization for Research and Treatment of Cancer Body Image scale (BIS) between open radical cystectomy (ORC) and robot-assisted radical cystectomy (RARC). Methods This was a retrospective case series of all patients who underwent radical cystectomy. Patients were grouped based on surgical approach (open vs robot assisted) and diversion technique (extracorporeal vs intracorporeal). Patients completed BCI and BIS preoperatively and at standardized postoperative intervals (at least 2). The primary exposure variable was surgical approach. The primary outcome measure was difference in interval and baseline BCI and BIS scores in each group. The Fisher exact, Wilcoxon rank-sum, and Kruskal-Wallis tests were used for comparisons. Results Eighty-two and 100 patients underwent RARC and ORC, respectively. Compared with RARC, more patients undergoing ORC had an American Society of Anesthesiology score >3 (66% vs 45.1% RARC; P =.007) and shorter median operative time (350 vs 380 minutes; P =.009). Baseline urinary, bowel, sexual function, and body image were not different between both the groups (P = 1.0). Longitudinal postoperative analysis revealed better sexual function in ORC group (P =.047), with no significant differences between both the groups in the other 3 domains (P =.11,.58, and.93). Comparisons regarding diversion techniques showed similar findings in baseline and postoperative HRQL data, with no significant differences in the HRQL and body image domains. Conclusion RARC has comparable HRQL outcomes to ORC using validated BCI and BIS. The diversion technique used does not seem to affect patients' quality of life. © 2014 Elsevier Inc. All Rights Reserved.
Publication Type: Journal: Article
Source: EMBASE

Title: Health-related quality of life outcomes after robot-assisted and open radical cystectomy using a validated bladder-specific instrument: a multi-institutional study.
Citation: Urology, Jun 2014, vol. 83, no. 6, p. 1300-1308 (June 2014)
Author(s): Aboumohamed, Ahmed A, Raza, Syed Johar, Al-Daghmin, Ali, Tallman, Christopher, Creighton, Terrance, Crossley, Heather, Dailey, Stephen, Khan, Aabroo, Din, Rakeeba, Mehedint, Diana, Wang, Katy, Shi, Yi, Sharif, Mohamed, Wilding, Gregory, Weizer, Alon, Guru, Khurshid A

Abstract: To evaluate health-related quality of life (HRQL) using validated bladder-specific Bladder Cancer Index (BCI) and European Organization for Research and Treatment of Cancer Body Image scale (BIS) between open radical cystectomy (ORC) and robot-assisted radical cystectomy (RARC). This was a retrospective case series of all patients who underwent radical cystectomy. Patients were grouped based on surgical approach (open vs robot assisted) and diversion technique (extracorporeal vs intracorporeal). Patients completed BCI and BIS preoperatively and at standardized postoperative intervals (at least 2). The primary exposure variable was surgical approach. The primary outcome measure was difference in interval and baseline BCI and BIS scores in each group. The Fisher exact, Wilcoxon rank-sum, and Kruskal-Wallis tests were used for comparisons. Eighty-two and 100 patients underwent RARC and ORC, respectively. Compared with RARC, more patients undergoing ORC had an American Society of Anesthesiology score≥3 (66% vs 45.1% RARC; P=.007) and shorter median operative time (350 vs 380 minutes; P=.009). Baseline urinary, bowel, sexual function, and body image were not different between both the groups (P=1.0). Longitudinal postoperative analysis revealed better sexual function in ORC group (P=.047), with no significant differences between both the groups in the other 3 domains (P=.11, .58, and .93). Comparisons regarding diversion techniques showed similar findings in baseline and postoperative HRQL data, with no significant differences in the HRQL and body image domains. RARC has comparable HRQL outcomes to ORC using validated BCI and BIS. The diversion technique used does not seem to affect patients' quality of life.
Source: Medline

Title: Robot-assisted laparoscopic radical cystectomy
Citation: EWHA Medical Journal, 2014, vol./is. 37/1(10-15), 2234-3180;2234-2591 (2014)
Author(s): Kim K.H., Lee D.H.
Language: Korean
Abstract: Robot-assisted laparoscopic radical cystectomy (RARC) for the treatment of muscle invasive bladder cancer is being increasingly applied. Radical cystectomy is complex procedure which should be performed with extensive lymph node dissection and urinary diversion. Currently, the techniques of RARC are well-described, and the feasibility and safety of RARC has been demonstrated. While extracorporeal approach is preferred method for urinary diversion, intracorporeal urinary diversion is gaining popularity. Positive surgical margins are similar to large open series but inferior for locally advanced disease. However, local recurrence and survival rates seem equivalent to open series at short and mid-term follow up. Randomized controlled trial should be conducted to rigorously assess the oncologic outcomes of RARC compared to open radical cystectomy.
Publication Type: Journal: Review
Source: EMBASE

Title: Sarcopenia as a predictor of complications and survival following radical cystectomy
Citation: Journal of Urology, 2014, vol./is. 191/6(1714-1720), 0022-5347;1527-3792 (2014)
Author(s): Smith A.B., Deal A.M., Yu H., Boyd B., Matthews J., Wallen E.M., Pruthi R.S., Woods M.E., Muss H., Nielsen M.E.
Language: English
Abstract: Purpose: Patients undergoing radical cystectomy face substantial but highly variable risks of major complications. Risk stratification may be enhanced by objective measures such as sarcopenia. Sarcopenia (loss of skeletal muscle mass) has emerged as a novel biomarker associated with adverse outcomes in many clinical contexts relevant to cystectomy. Based on these data we hypothesized that sarcopenia would be associated with increased 30-day major complications and mortality after radical cystectomy for bladder cancer.Materials and Methods: We performed a retrospective study of patients treated with radical cystectomy at our institution from 2008 to 2011. Sarcopenia was assessed by measuring cross-sectional area of the psoas muscle (total psoas area) on preoperative computerized tomography. Cutoff points were developed and evaluated using ROC curves to determine predictive ability in men and women for outcomes of major complications and survival.Results: Of 224 patients with bladder cancer 200 underwent preoperative computerized tomography within 1 month of surgery. Total psoas area was calculated with a mean score of 712 and 571 cm²/m² in men and women, respectively. A clear association was noted between major complications and lower total psoas area in women using a cutoff of 523 cm2/m2 to define sarcopenia (AUC 0.70). Sarcopenia was not significantly associated with complications in men. There was a nonsignificant trend of sarcopenia with worse 2-year survival.Conclusions: Sarcopenia in women was a predictor of major complications after radical cystectomy. Further research confirming sarcopenia as a useful predictor of complications would support the development of targeted interventions to mitigate the untoward effects of sarcopenia before cancer surgery.
Publication Type: Journal: Article
Source: EMBASE

Title: Commentary on "Robot-assisted laparoscopic vs open radical cystectomy: Comparison of complications and perioperative oncological outcomes in 200 patients." Kader AK, Richards KA, Krane LS, Pettus JA, Smith JJ, Hemal AK, Division of Urology, UC San Diego Health System, San Diego, CA.: BJU Int 2013; 112(4):E290-4. doi:10.1111/bju.12167. [Epub 2013 Jul 1].
Citation: Urologic oncology, Nov 2014, vol. 32, no. 8, p. 1348. (November 2014)
Author(s): See, William A
Abstract: To compare perioperative morbidity and oncological outcomes of robot-assisted laparoscopic radical cystectomy (RARC) to open RC (ORC) at a single institution. A retrospective analysis was performed on a consecutive series of patients undergoing RC (100 RARC and 100 ORC) at Wake Forest University with curative intent from 2006 until 2010. Complication data using the Clavien system were collected for 90 days postoperatively. Complications and other perioperative

outcomes were compared between patient groups. Patients in both groups had comparable preoperative characteristics. The overall and major complication (Clavien ≥ 3) rates were lower for RARC patients at 35 vs 57% (P = 0.001) and 10 vs 22% (P = 0.019), respectively. There were no significant differences between groups for pathological outcomes, including stage, number of nodes harvested or positive margin rates. Our data suggest that patients undergoing RARC have perioperative oncological outcomes comparable with ORC, with fewer overall or major complications. Definitive claims about comparative outcomes with RARC require results from larger, randomised controlled trials.
Source: Medline

Title: The effect of nerve-sparing robot-assisted radical cystoprostatectomy on erectile function in a preoperatively potent population.
Citation: Journal of endourology / Endourological Society, Nov 2014, vol. 28, no. 11, p. 1352-1356 (November 2014)
Author(s): Haberman, Ken, Wittig, Kristina, Yuh, Bertram, Ruel, Nora, Lau, Clayton, Wilson, Timothy G, Chan, Kevin G
Abstract: To evaluate the effects on the potency of a bilateral cavernosal nerve-sparing approach to robot-assisted radical cystectomy (RARC) in a preoperatively potent population. We conducted a retrospective review of 254 patients who underwent RARC between 2003 and 2012 at our single institution. We identified 33 men who were younger than 65 years and had evidence of preoperative erections on chart review. Twenty-nine of them underwent a bilateral nerve-sparing procedure, with 28 (97%) having concomitant creation of a continent urinary diversion. Median follow-up was 32.9 months. Postoperatively, 13 (45%) patients had documented erections sufficient for penetration with or without the use of phosphodiesterase 5 inhibitors. Additional 6 (21%) were potent with intracavernosal injections (ICI), and the remaining 10 (34%) failed ICI usage, had on-going medical issues, or lost interest in sexual activity. With univariate analysis, no significant difference was found between those who recovered erections and those who did not on a wide range of demographic, operative, and perioperative factors, including age, comorbidities, operative time, or pathologic stage. Despite neurovascular bundle preservation, there was no local cancer recurrence and no positive soft tissue margins. A cavernosal nerve-sparing robot-assisted approach to radical cystectomy allows for recovery of potency without sacrificing oncologic outcomes even with higher risk disease as 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: Medline

Study type not clear

Title: Controversies in Robotics: Open Versus Robotic Radical Cystectomy
Citation: Clinical Genitourinary Cancer, October 2015, vol./is. 13/5(421-427), 1558-7673;1938-0682 (01 Oct 2015)
Author(s): Patel R., Szymaniak J., Radadia K., Faiena I., Lasser M.
Language: English
Abstract: Open radical cystectomy (ORC) remains the gold standard for treatment of muscle-invasive bladder cancer and certain cases of high-risk noninvasive bladder cancer. However, ORC is associated with significant morbidity, and there is promise of improved outcomes with the emergence of minimally invasive surgery. Because of the increased adoption of robotic radical cystectomy (RRC), we sought to review the current literature on the robotic approach. We explored the surgical techniques, perioperative and postoperative complications, oncologic and functional outcomes, and quality of life of patients with RRC versus ORC. Current data appear to favor RRC in perioperative outcomes and patient recovery, although RRC continues to be associated with longer surgical times and higher costs. Oncologic data are also promising, however data on long-term oncologic outcomes are insufficient. To date, there is evidence of similar functional outcomes between RRC and ORC continence, but there is a paucity of rigorous, standardized studies on health-related quality of life for continent versus incontinent diversion. Even as use of RRC steadily grows, there is a lack of consensus on the type of approach and urinary diversion that is optimal. We assessed the influence of surgeon experience on the totally intracorporeal urinary diversion and its feasibility to be widely adopted. We aimed to answer the question of whether there are significant benefits to RRC, and furthermore, of the effect of the approach on the choice of urinary diversion.
Publication Type: Journal: Review
Source: EMBASE

Title: Words of Wisdom. Re: robotic intracorporeal orthotopic neobladder during radical cystectomy in 132 patients.
Citation: European urology, Jun 2015, vol. 67, no. 6, p. 1191-1192 (June 2015)
Author(s): Giannarini, Gianluca, Palumbo, Vito, Ficarra, Vincenzo
Source: Medline

Title: Robot-assisted radical cystectomy: extracorporeal vs intracorporeal urinary diversion.
Citation: The Journal of urology, May 2015, vol. 193, no. 5, p. 1467-1469 (May 2015)
Author(s): Chan, Kevin G, Collins, Justin W, Wiklund, N Peter
Source: Medline

Title: Radical transurethral resection alone, robotic or partial cystectomy, or extended lymphadenectomy: can we select patients with muscle invasion for less or more surgery?

Citation: The Urologic clinics of North America, May 2015, vol. 42, no. 2, p. 189 (May 2015)
Author(s): Cha, Eugene K, Donahue, Timothy F, Bochner, Bernard H
Abstract: Improvements in the accuracy of clinical staging and refinements in patient selection may allow for improved outcomes of bladder-preservation strategies for muscle-invasive bladder cancer incorporating radical transurethral resection (TUR) and partial cystectomy (PC). Retrospective studies of patients treated with radical cystectomy and pelvic lymph node dissection have reported an association between greater extent of lymphadenectomy and improved clinical outcomes. However, there is no consensus regarding the optimal extent of lymphadenectomy, as there are currently no reports from prospective, randomized trials to address this issue in regards to cancer-specific and overall survival. Future advances in the understanding of the appropriate extent of lymphadenectomy requires well-designed prospective clinical trials that directly compare varying extents of surgery with their ability to provide local and distant disease control and disease-specific survival.

Source: Medline

Title: Differences in the distribution of recurrence locations between patients who undergo open and robot-assisted radical cystectomy for bladder cancer
Citation: Journal of Urology, April 2015, vol./is. 193/4 SUPPL. 1(e807-e808), 0022-5347 (April 2015)
Author(s): Nguyen D., Al Hussein Al Awamlh B., Wu X., Inoyatov I., Ayangbesan A., Faltas B., Christos P., O'Malley P., Scherr D.
Language: English
Abstract: INTRODUCTION AND OBJECTIVES: Concerns remain whether robot-assisted radical cystectomy (RARC) compromises survival because of inadequate oncologic resection or alteration of recurrence patterns. In this study, we aimed to compare recurrence patterns and evaluate factors predicting recurrence following open radical cystectomy (ORC) and RARC. METHODS: 383 consecutive patients who underwent radical cystectomy (120 ORCs, 263 RARCs) at an academic institution from July 2001 to February 2014 were included. Descriptive statistics were used to compare recurrence patterns at 2 years. Recurrence-free survival estimates were generated using the Kaplan-Meier method. Cox regression models were built to evaluate the effects of clinicopathologic variables and operative technique on the risk of recurrence. RESULTS: At 2 and 3 years, recurrence-free survival rates were 68% and 63% for ORC and 73% and 71% for RARC, respectively (log rank p=0.11). Rates of local recurrence at 2 years were similar between ORC and RARC patients (Table). Similarly, distant recurrence rates at 2 years were not different between ORC and RARC patients. However, the distribution of sites of first recurrence was significantly different between the two surgical techniques. Specifically, extrapelvic lymph node locations (4/26 ORC patients with distant recurrence vs 10/ 43 RARC patients with distant recurrence) and peritoneal carcinomatosis (2/26 ORC patients with distant recurrence vs 9/43 RARC patients with distant recurrence) were numerically more frequent in RARC patients than in ORC patients. In multivariable analyses, RARC was not an independent predictor of recurrence, adjusting for age,

gender, clinical stage, perioperative chemotherapy, pathologic stage, nodal stage, positive surgical margin, and lymphovascular invasion (HR 0.78, 85%CI 0.5-1.21; p=0.2). CONCLUSIONS: In our series, recurrence-free survival was similar following ORC and RARC, and RARC provided no additional risk of recurrence compared to ORC. However, the distribution of distant recurrences was statistically different between the two techniques, with extrapelvic lymph node locations and peritoneal carcinomatosis found more frequently in RARC patients. If confirmed in larger studies, these findings may lead to a reappraisal of the value of RARC. (Table Presented).

Publication Type: Journal: Conference Abstract

Source: EMBASE

Title: Oncological outcomes of totally intracorporeal robot-assisted radical cystectomy: Results from the ERUS Scientific Working Group (ESWG)
Citation: European Urology, Supplements, April 2015, vol./is. 14/2(e540-e540b), 1569-9056 (April 2015)
Author(s): Collins J., Hosseini A., Nyberg T., Schumacher M.C., Canda A.E., Wijburg C., Schwentner C., Balbay M.D., Decaestecker K., Edeling S., Pokupic S., Mottrie A., Guru K., Wiklund N.P.
Language: English
Abstract: INTRODUCTION & OBJECTIVES: Data on the oncological outcomes in patients undergoing robot-assisted radical cystectomy (RARC) is limited. Globally extracorporeal urinary diversion following RARC remains the most common approach despite potential advantages of a completely minimally invasive approach. We report oncological outcomes and associated prognostic factors from a multi-institutional European database focusing on the centres performing totally intracorporeal RARC. MATERIAL & METHODS: In the ESWG database, 467 patients underwent totally intracorporeal RARC for bladder cancer between 2003 and 2014. Clinical and pathological data at the time of the latest follow-up was reviewed. Recurrence free survival (RFS), cancer specific survival (CSS) and overall survival (OS) were the outcomes of interest and evaluated using the Kaplan Meier estimator. Multi-variable Cox regression analysis was performed to identify factors associated with outcomes of interest. RESULTS: Mean age was 67 years, 80% were men. 384 (82%) patients were alive at the time of the analysis. Median follow-up was 17.9 months (range 1-130 months). 87 patients (19%) had undergone surgery 3 or more years' ago. Median follow-up of patients alive was 16 months. 31% patients had pathological non organ-confined disease. Positive surgical margins were present in 5%; median lymph node yield was 18 with 19% of patients having positive lymph nodes. The 3-year RFS, CSS and OS were 73%, 75% and 73% respectively. On multi-variable analysis, non-organ confined disease was found to impact RFS, CSS and OS (HR 4.0, 4.3 and 4.2 respectively) and LN positive disease was associated with poorer RFS (HR 2.1). Histopathology stage pT0 was a positive prognostic indicator associated with better RFS, CSS and OS (HR 0.15, 0.16 and 0.74 respectively). CONCLUSIONS: This is the largest reported multi-institutional cohort

of totally intracorporeal RARC showing acceptable medium term survival outcomes comparable to open radical cystectomy series. The ESWG database indicates that a totally intracorporeal approach is replicable. (Figure Presented).
Publication Type: Journal: Conference Abstract
Source: EMBASE

Title: Radical cystectomy: open vs robotic approach.
Citation: The Journal of urology, Feb 2015, vol. 193, no. 2, p. 400-402 (February 2015)
Author(s): Lau, Clayton Stephen, Blackwell, Robert H, Quek, Marcus L
Source: Medline

Title: A pilot ex vivo evaluation of a telerobotic system for transurethral intervention and surveillance.
Citation: Journal of endourology / Endourological Society, Feb 2015, vol. 29, no. 2, p. 231-234 (February 2015)
Author(s): Pickens, Ryan B, Bajo, Andrea, Simaan, Nabil, Herrell, Duke
Abstract: Transurethral resection of bladder tumor (TURBT) and pathological staging are both standard surgical therapies for nonmuscle-invasive bladder cancer and integral parts of the diagnostic evaluation and progression monitoring of all bladder tumors. We developed and tested a dexterous robot that can fit through a standard resectoscope for evaluation for possible en bloc resection of bladder tumors, especially tumors along the dome and anterior wall of the bladder. Our dexterous robot uses a continuum (snake-like) mechanical architecture with three working channels through which a fiberscope, biopsy graspers, and a holmium laser were placed. The continuum robot has two segments. Using indigo carmine, injections were performed through the detrusor muscle into the mucosa of the ex vivo bovine bladders at a total of 11 positions throughout all quadrants of the bladder. The snake robot was used in conjunction with the holmium laser to ablate nine of the lesions; two additional lesions were resected en bloc using the grasper and the laser down through the muscle layer. Both experiments showed that the robotic system was able to directly visualize all 11 targets. In both the bladders, we were able to resect en bloc two tumors using the grasper and 200 μm holmium laser fiber down to the muscle layer indicating a good resection. All of the other targets were completely ablated using the holmium laser. The dexterous robot allowed for visualization as well as provided adequate ablation and en bloc resection of bladder lesions throughout the entire bladder.
Source: Medline

Title: [LAPAROSCOPIC AND OPEN RADICAL CYSTECTOMY FOR BLADDER CANCER].
Citation: Voprosy onkologii, Jan 2015, vol. 61, no. 3, p. 352-361, 0507-3758 (2015)
Author(s): Nosov, A K, Reva, S A, Dzhalilov, I B, Petrov, S B

Abstract: Radical cystectomy is the standard method for treatment of muscle-invasive and locally advanced bladder cancer. Several less invasive approaches have been suggested recently, including totally laparoscopic radical cystectomy and robotic cystectomy. However despite significant improvements in surgical techniques the overall occurrence of perioperative complications is still high. Analysis of the literature data and comparison of these data with the results of our study was performed with respect to perioperative complications after radical cystectomy and oncological outcomes. In most of the studies, operating time during laparoscopic cystectomy was longer than that of open approach. Despite that, there was no influence of type of surgery on intraoperative complications. Major complication rates were similar between all groups. However laparoscopic cystectomy had lower rate of minor complications compared to open cystectomy. Laparoscopic cystectomy is safe and associated with lower blood loss, decreased postoperative ileus and lower length of stay compared with open radical cystectomy. Laparoscopic surgery for bladder cancer decreased minor complications (mainly due to lower bleeding and gastrointestinal complication rate) and had no impact on major complications. Moreover, if performed following the oncologic principles of open surgery, our results and literature data suggest that LRC is safe and determines non-inferior long-term cancer control compared with open surgery.
Source: Medline

Title: Standard cystectomy fits all: Truth or myth?
Citation: Translational Andrology and Urology, 2015, vol./is. 4/3(254-260), 2223-4683;2223-4691 (2015)
Author(s): Roth B., Thalmann G.N.
Language: English
Abstract: Radical cystectomy (RC) with pelvic lymph node dissection (PLND) followed by urinary diversion is the treatment of choice for muscle-invasive bladder cancer (BC) and non-invasive BC refractory to transurethral resection of the bladder (TUR-B) and/or intravesical instillation therapies. Since the morbidity and possible mortality of this surgery are relevant, care must be taken in the preoperative selection of patients for the various organ-sparing procedures (e.g., bladder-sparing, nerve sparing, seminal vesicle sparing) and various types of urinary diversion. The patient's performance status and comorbidities, along with individual tumor characteristics, determine possible surgical steps during RC. This individualized approach to RC in each patient can maximize oncological safety and minimize avoidable side effects, rendering 'standard' cystectomy a surgery of the past.
Publication Type: Journal: Review
Source: EMBASE

Title: LAPAROSCOPIC AND OPEN RADICAL CYSTECTOMY FOR BLADDER CANCER
Citation: Voprosy onkologii, 2015, vol./is. 61/3(352-361), 0507-3758 (2015)
Author(s): Nosov A.K., Reva S.A., Dzhalilov I.B., Petrov S.B.
Language: Russian

Abstract: Radical cystectomy is the standard method for treatment of muscle-invasive and locally advanced bladder cancer. Several less invasive approaches have been suggested recently, including totally laparoscopic radical cystectomy and robotic cystectomy. However despite significant improvements in surgical techniques the overall occurrence of perioperative complications is still high. Analysis of the literature data and comparison of these data with the results of our study was performed with respect to perioperative complications after radical cystectomy and oncological outcomes. In most of the studies, operating time during laparoscopic cystectomy was longer than that of open approach. Despite that, there was no influence of type of surgery on intraoperative complications. Major complication rates were similar between all groups. However laparoscopic cystectomy had lower rate of minor complications compared to open cystectomy. Laparoscopic cystectomy is safe and associated with lower blood loss, decreased postoperative ileus and lower length of stay compared with open radical cystectomy. Laparoscopic surgery for bladder cancer decreased minor complications (mainly due to lower bleeding and gastrointestinal complication rate) and had no impact on major complications. Moreover, if performed following the oncologic principles of open surgery, our results and literature data suggest that LRC is safe and determines non-inferior long-term cancer control compared with open surgery.
Publication Type: Journal: Review
Source: EMBASE

Title: Standardized analysis of complications after robot-assisted radical cystectomy: Korea university hospital experience
Citation: Korean Journal of Urology, January 2015, vol./is. 56/1(48-55), 2005-6737;2005-6745 (01 Jan 2015)
Author(s): Pyun J.H., Kim H.K., Kim J.Y., Kim S.B., Cho S., Kang S.G., Ko Y.H., Cheon J., Lee J.G., Kim J.J., Kang S.H.
Language: English
Abstract: Purpose: To analyze the complications after robot-assisted radical cystectomy (RARC) by use of a standardized reporting methodology by a single surgeon.Materials and Methods: We prospectively reviewed a maintained institutional database of 52 patients who underwent RARC to manage bladder cancer and were followed up in 3 months by a single surgeon at Korea University Medical Center from 2007 through 2014. All complications within 90 days of surgery were defined and categorized into 5 grades according to the Clavien-Dindo classification. Logistic regression analysis was used to identify predictors of complications.Results: Fifty percent of patients (26 of 52) experienced a complication of any grade <90 days after surgery, and 11 patients (21.2%) experienced a major complication. Complications were grouped in systems-based categories. Fifty complications occurred in 52 patients and hematologic complication (transfusion) was the most common (13 of 52). Wound dehiscence, anastomotic leakage, urinary tract obstruction, mechanical obstruction, and thromboembolism occurred as major complications. Mean estimated blood loss (EBL) was 247 mL and mean total operative time was 496 minutes. The mean number of lymph nodes harvested was 24.6, with 30.5 for extended dissection. EBL (over 300 mL), operative time, and

method of urinary diversion were significant negative predictors of minor complications, whereas EBL (over 300 mL) was a significant negative predictor of major complications (p<0.05).Conclusions: The present results show that the complication rate reported by use of a standardized methodology after robotic radical cystectomy is still considerable although comparable to that of contemporary robot series. EBL, operative time, and diversion methods were predictors of complications.
Publication Type: Journal: Article
Source: EMBASE
Full Text:
Available from *National Library of Medicine* in Korean Journal of Urology

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Title: Robotic and conventional open radical cystectomy lead to similar postoperative health-related quality of life.
Citation: BJU international, Dec 2014, vol. 114, no. 6, p. 793-794 (December 2014)
Author(s): Hanske, Julian, Roghmann, Florian, Noldus, Joachim, Trinh, Quoc-Dien
Source: Medline

Title: Editorial comment.
Citation: The Journal of urology, Dec 2014, vol. 192, no. 6, p. 1740. (December 2014)
Author(s): Guru, Khurshid A
Source: Medline

Title: Reply from Authors re: Cora N. Sternberg, Richard Sylvester. Thoughts on a systematic review and meta-analysis of adjuvant chemotherapy in muscle-invasive bladder cancer. Eur Urol 2014;66:55-6
Citation: European Urology, July 2014, vol./is. 66/1(57-58), 0302-2838;1873-7560 (July 2014)
Author(s): Leow J.J., Chang S.L., Bellmunt J.
Language: English
Publication Type: Journal: Editorial
Source: EMBASE

Title: Robot-assisted intracorporeal urinary diversion: where do we stand in 2014?
Citation: The Urologic clinics of North America, Nov 2014, vol. 41, no. 4, p. 503-509 (November 2014)
Author(s): Raza, Syed Johar, Tawfeeq, Mohammed, Al-Daghmin, Ali, Guru, Khurshid A
Abstract: Radical cystectomy can only be considered as minimally invasive when both extirpative and reconstructive part of the procedure are performed with an intracorporeal approach. Robot-assisted radical cystectomy makes it possible to achieve this task, which seemed difficult with conventional laparoscopy. Intracorporeal urinary diversion (ICUD) is associated with better perioperative outcomes. Quality-of-life assessments and functional outcomes from continent ICUD are encouraging. Working in high-volumes center with mentored training can help

robotic surgeons to learn the techniques of ICUD in conjunction with robot-assisted radical cystectomy. This article discusses the perioperative and functional outcomes of ICUD with a review of literature.
Source: Medline

Title: Robotic intracorporeal urinary diversion: technical details to improve time efficiency
Citation: Journal of endourology / Endourological Society, November 2014, vol./is. 28/11(1320-1327), 1557-900X (01 Nov 2014)
Author(s): Desai M.M., de Abreu A.L., Goh A.C., Fairey A., Berger A., Leslie S., Xie H.W., Gill K.S., Miranda G., Aron M., Sotelo R.J., Sun Y., Xu Z., Gill I.S.
Language: English
Abstract: OBJECTIVES: To present time-efficiency data during our initial experience with intracorporeal urinary diversion and technical tips that may shorten operative time early in the learning curve.PATIENTS AND METHODS: Data were analyzed in the initial 37 consecutive patients undergoing robotic radical cystectomy and intracorporeal urinary diversion in whom detailed stepwise operative time data were available. Median age was 65 years and median body mass index was 27. Neoadjuvant chemotherapy was administered in 6 patients and 11 patients had clinical evidence of T3 or lymph node-positive disease. Each component of the operation was subdivided into specific steps and operative time for each step was prospectively recorded. Peri-operative and follow-up data up to 90 days and final pathological data were recorded.RESULTS: All procedures were completed intracorporeally and robotically without need for conversion to open surgery or extracorporeal diversion. Median total operative time was 387 vs 386 minutes ($p=0.2$) and median total console time was 361 vs 295 minutes ($p<0.007$) for orthotopic neobladder and ileal conduit, respectively. Median time for radical cystectomy was 77 minutes, extended pelvic lymph node dissection was 63 minutes, and diversion was 111 minutes (ileal conduit 92 minutes and orthotopic neobladder 124 minutes). Median estimated blood loss was 250mL, and median hospital stay was 9 days. High grade (Clavien grade 3-5) complications at 30 and 90 days follow-up were recorded in 6 (16%) and 9 (24%) patients, respectively. Over a median follow-up of 16 months, 12 (32%) patients experienced disease recurrence and 9 (24%) died from bladder cancer. These correspond to 1-year recurrence-free and overall survival of 64% and 70%, respectively.CONCLUSIONS: Intracorporeal urinary diversion following robotic radical cystectomy can be safely performed and reproducible in a time-efficient manner even during the early learning curve.
Publication Type: Journal: Article
Source: EMBASE

Title: More on robot-assisted laparoscopic radical cystectomy.
Citation: The New England journal of medicine, Oct 2014, vol. 371, no. 17, p. 1654-1655 (October 23, 2014)
Author(s): Bjurlin, Marc A, Zhao, Lee C, Huang, William C
Source: Medline

Title: More on robot-assisted laparoscopic radical cystectomy.
Citation: The New England journal of medicine, Oct 2014, vol. 371, no. 17, p. 1655. (October 23, 2014)
Author(s): Bochner, Bernard H, Laudone, Vincent P, Memorial Sloan Kettering Cancer Center Bladder Cancer Surgical Trials Group
Source: Medline

Title: Effect of alvimopan on return of bowel function after robot-assisted radical cystectomy.
Citation: Journal of laparoendoscopic & advanced surgical techniques. Part A, Oct 2014, vol. 24, no. 10, p. 693-697 (October 2014)
Author(s): Tobis, Scott, Heinlen, Jonathan E, Ruel, Nora, Lau, Clayton, Kawachi, Mark, Wilson, Timothy, Chan, Kevin
Abstract: Alvimopan has been shown to improve time to return of bowel function in patients undergoing bowel resection. The objective of this study is to determine if alvimopan has similar benefits for patients undergoing robot-assisted radical cystectomy (RARC). All RARC cases were reviewed from January 2008 to March 2012. All patients during this time were administered alvimopan unless they had been receiving narcotics preoperatively. Patients receiving alvimopan received a preoperative dose of 12 mg perorally and then were dosed twice daily for 7 days or until first bowel movement. Clinicopathologic outcomes were summarized and compared, and functional outcomes of treated patients were compared with outcomes of untreated patients. One hundred seventeen RARCs meeting study criteria were performed. All urinary diversions used an extracorporeal approach. Urinary diversions consisted of 50 Studer neobladders, 22 Indiana pouches, and 45 ileal conduits. Fifty-four patients received alvimopan, and 63 did not. The median time to first bowel movement was 5 days in the alvimopan group and 6 days in the untreated group (P=.03). Median time to solid diet was 6 days in the treated group and 7 days in the untreated group (P=.03). There was a trend toward fewer hospital days in the alvimopan group (alvimopan, 8 days; untreated, 9 days; P=.1). Alvimopan administration appears to reduce the time to return of bowel function and initiation of diet following RARC. This was a trend toward shorter hospitalization in the alvimopan group. Alvimopan should be considered in ongoing research into protocols to aid in shorter convalescence following RARC.
Source: Medline

Title: Analgesic opioid dose is an important indicator of postoperative ileus following radical cystectomy with ileal conduit: experience in the robotic surgery era.
Citation: Yonsei medical journal, Sep 2014, vol. 55, no. 5, p. 1359-1365 (September 2014)
Author(s): Koo, Kyo Chul, Yoon, Young Eun, Chung, Byung Ha, Hong, Sung Joon, Rha, Koon Ho

Abstract: Postoperative ileus (POI) is common following bowel resection for radical cystectomy with ileal conduit (RCIC). We investigated perioperative factors associated with prolonged POI following RCIC, with specific focus on opioid-based analgesic dosage. From March 2007 to January 2013, 78 open RCICs and 26 robot-assisted RCICs performed for bladder carcinoma were identified with adjustment for age, gender, American Society of Anesthesiologists grade, and body mass index (BMI). Perioperative records including operative time, intraoperative fluid excess, estimated blood loss, lymph node yield, and opioid analgesic dose were obtained to assess their associations with time to passage of flatus, tolerable oral diet, and length of hospital stay (LOS). Prior to general anaesthesia, patients received epidural patient-controlled analgesia (PCA) consisted of fentanyl with its dose adjusted for BMI. Postoperatively, single intravenous injections of tramadol were applied according to patient desire. Multivariate analyses revealed cumulative dosages of both PCA fentanyl and tramadol injections as independent predictors of POI. According to surgical modality, linear regression analyses revealed cumulative dosages of PCA fentanyl and tramadol injections to be positively associated with time to first passage of flatus, tolerable diet, and LOS in the open RCIC group. In the robot-assisted RCIC group, only tramadol dose was associated with time to flatus and tolerable diet. Compared to open RCIC, robot-assisted RCIC yielded shorter days to diet and LOS; however, it failed to shorten days to first flatus. Reducing opioid-based analgesics shortens the duration of POI. The utilization of the robotic system may confer additional benefit.
Source: Medline

Full Text:
Available from *National Library of Medicine* in Yonsei Medical Journal

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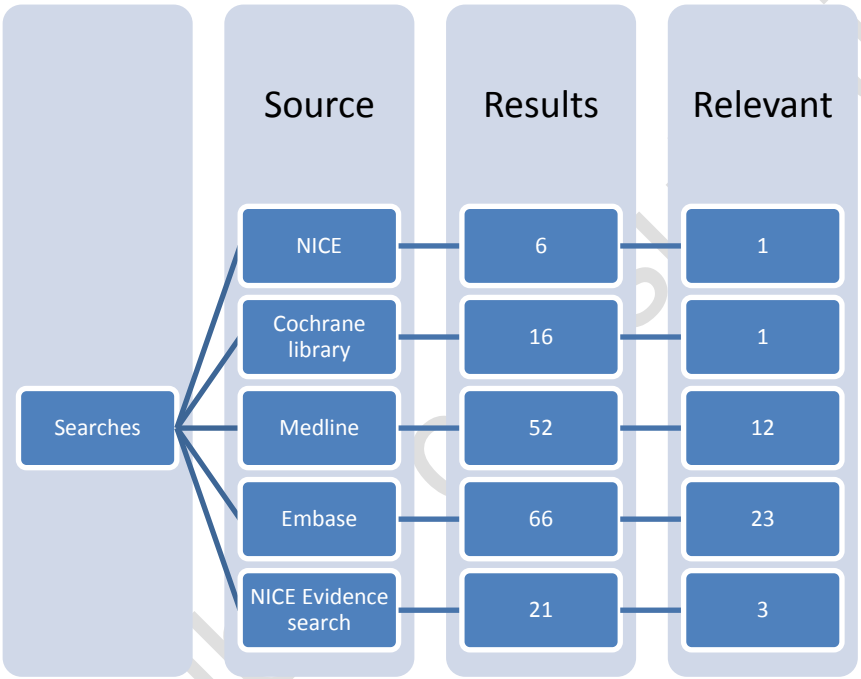
Title: Interstitial brachytherapy for bladder cancer with the aid of laparoscopy
Citation: Journal of Contemporary Brachytherapy, September 2014, vol./is. 6/3(313-317), 1689-832X (30 Sep 2014)
Author(s): Van Klinken A.N., Bus S.J.E.A., Janssen T.G., Van Gellekom M.P.R., Smits G., Van Der Steen-Banasik E.
Language: English
Abstract: Since 2009, 40 patients with a T1/T2 bladder cancer have been treated at ARTI with interstitial brachytherapy via laparoscopy. Under general anaesthesia, the tumour area is implanted under cystoscopic control with the aid of a laparoscope, and instruments are attached to the Da Vinci robot. Mapping is then done via a simulator photo and a CT scan. With this method, the patient has fewer complications and the average hospitalization time is halved, while a consistent quality of implant is maintained. This method is also associated with a major reduction in the number of problems that can be attributed to the accessibility of the catheter.
Publication Type: Journal: Article

Title: Unveiling the surgical risk associated with neoadjuvant chemotherapy in bladder cancer

Citation: BJU International, August 2014, vol./is. 114/2(163-164), 1464-4096;1464-410X (August 2014)
Author(s): Bellmunt J., Leow J.J., Martin-Doyle W.
Language: English
Publication Type: Journal: Editorial
Source: EMBASE

Appendix search strategies

Search History:



NICE www.nice.org.uk
Search terms – Cystectomy – 6
1 guideline – Bladder cancer published February 2015
http://www.nice.org.uk/guidance/ng2/history

Medline and Embase
1. Medline; URINARY BLADDER NEOPLASMS/; 45714 results.
2. Medline; "bladder cancer".ti,ab; 23185 results.
3. Medline; 1 OR 2; 50449 results.
4. Medline; CYSTECTOMY/; 6114 results.
5. Medline; "open cystectomy".ti,ab; 47 results.
6. Medline; LAPAROSCOPY/; 64961 results.
7. Medline; ROBOTIC SURGICAL PROCEDURES/; 732 results.
8. Medline; ROBOTICS/; 15514 results.

9. Medline; "da vinci".ti,ab; 1975 results.
10. Medline; 4 OR 5 OR 6 OR 7 OR 8 OR 9; 83806 results.
11. Medline; 3 AND 10; 5161 results.
12. Medline; 11 [Limit to: Publication Year 2014-2015]; 567 results.
13. Medline; 3 AND 4; 4979 results.
14. Medline; 5 OR 6 OR 7 OR 8 OR 9; 78336 results.
15. Medline; 13 AND 14; 459 results.
16. Medline; 7 AND 8 AND 9 AND 13; 0 results.
17. Medline; 7 OR 8 OR 9; 16873 results.
18. Medline; 13 AND 17; 272 results.
19. Medline; 18 [Limit to: Publication Year 2014-2015]; 52 results.
20. EMBASE; URINARY BLADDER NEOPLASMS/; 18954 results.
21. EMBASE; "bladder cancer".ti,ab; 31661 results.
22. EMBASE; 20 OR 21; 45744 results.
23. EMBASE; CYSTECTOMY/; 18940 results.
24. EMBASE; "open cystectomy".ti,ab; 106 results.
25. EMBASE; LAPAROSCOPY/; 57821 results.
26. EMBASE; ROBOTIC SURGICAL PROCEDURES/; 222 results.
27. EMBASE; ROBOTICS/; 27524 results.
28. EMBASE; "da vinci".ti,ab; 3439 results.
29. EMBASE; 23 OR 24 OR 25 OR 26 OR 27 OR 28; 102056 results.
30. EMBASE; 22 AND 29; 8458 results.
31. EMBASE; 30 [Limit to: Publication Year 2014-2015]; 1527 results.
32. EMBASE; 22 AND 23; 8327 results.
33. EMBASE; 24 OR 25 OR 26 OR 27 OR 28; 84770 results.
34. EMBASE; 32 AND 33; 486 results.
35. EMBASE; 26 AND 27 AND 28 AND 32; 1 results.
36. EMBASE; 26 OR 27 OR 28; 28955 results.
37. EMBASE; 32 AND 36; 355 results.
38. EMBASE; 37 [Limit to: Publication Year 2014-2015]; 66 results.

Cochrane

#1	MeSH descriptor: [Urinary Bladder Neoplasms] explode all trees	1102
#2	"bladder cancer"	1367
#3	#1 or #2	1763
#4	MeSH descriptor: [Cystectomy] explode all trees	194
#5	"open cystectomy"	1
#6	MeSH descriptor: [Laparoscopy] explode all trees	5053
#7	MeSH descriptor: [Robotic Surgical Procedures] explode all trees	6
#8	MeSH descriptor: [Robotics] explode all trees	594
#9	"da vinci"	113
#10	#3 and #4	153
#11	#5 or #6 or #7 or #8 or #9	5515
#12	#10 ad #11	16

NICE Evidence search www.evidence.nhs.uk
Cystectomy and robotic assisted surgery – 21 results, 2 guidelines and 1 systematic review included in this document

NHIR Horizon Scanning centre http://www.hsc.nihr.ac.uk/
"bladder cancer" and Cystectomy and robotic – no relevant results

NHIR journals library http://www.nihr.ac.uk/research/nihr-journals-library.htm
Unable to search as site not working

Google www.google.co.uk
site nhs: "bladder cancer" and Cystectomy and robotic
A few NHS England documents/ webpages found