Preoperative Preparation and Care

5

Jeffrey Holzbeierlein and Joshua G. Griffin

Introduction

Bladder cancer is the sixth most common malignancy in the USA, with an estimated 73,000 new cases diagnosed in 2012 [1]. Among these, approximately 25 % will initially present with muscle invasive disease. Radical cystectomy remains the gold standard in the management of non-metastatic muscle-invasive bladder cancer and provides the best chance for cure of this disease. Nonetheless, radical cystectomy is associated with significant perioperative morbidity and mortality rate of approximately 28 % and 2 %, respectively [2]. Invasive bladder cancer typically presents in the eighth decade, in a population of patients whom may have significant comorbidities, further compromising recovery from this procedure. Robot-assisted radical cystectomy has been shown to be a technically feasible procedure that may offer some advantages over the traditional open approach. This chapter focuses on the preoperative evaluation, preparation and perioperative care of patients undergoing robot-assisted radical cystectomy (RARC), with the goal of optimizing patient outcomes and minimizing complications. While written in the context of robotic surgery, this information can easily be applied to the open approach as well.

Evaluation

Initial evaluation for all patients includes a detailed history and physical examination followed by laboratory studies and radiographic imaging. Clinical staging with computed tomography is important to evaluate for locally advanced or metastatic disease, as this could affect decision-making regarding surgical treatment. For patients found to have locally or regionally advanced disease a bone scan may also be warranted. Although some reports also suggest utility of positron emission scans (PET scans) in diagnosing occult metastatic disease, our experience is that these have been of limited utility over traditional imaging and furthermore are not typically covered by insurance [3]. Although beyond the scope of this review, neoadjuvant chemotherapy has been demonstrated to provide a survival advantage to patients with muscle invasive disease, and thus, most of our patients will receive neoadjuvant chemotherapy prior to radical cystectomy [4]. Typically, for patients who receive chemotherapy, we advise waiting 2–4 weeks after the completion of chemotherapy to allow blood counts and platelet counts to recover.

J. Holzbeierlein, M.D. (✉)
Department of Urology, University of Kansas Medical Center, 3901 Rainbow Boulevard, Mail Stop 3016, Kansas City, KS 66160, USA
e-mail: jholzbeierlein@kumc.edu

J.G. Griffin
University of Kansas Medical Center, Kansas City, KS, USA

E.P. Castle and R.S. Pruthi (eds.), *Robotic Surgery of the Bladder*, DOI 10.1007/978-1-4614-4906-5_5,

Given that the population of muscle-invasive bladder cancer patients is older and often has a long history of smoking, it is imperative that the urologist identify any factors that may suggest underlying pulmonary or cardiovascular disease, both of which may need further evaluation. Those with a history of chronic obstructive pulmonary disease (COPD) or other chronic lung disease processes should undergo at minimum pulmonary function testing and arterial blood gas analysis. Carbon dioxide insufflation leads to significant pulmonary alterations including reduced lung volumes, hypercarbia, hypercapnia, and reduced venous return. While these physiologic changes are usually of no consequence in the healthy patient, they can be poorly tolerated if there is underlying pulmonary disease and hypoxemia can develop both during and after the operation [5]. Cardiac disease, including congestive heart failure and arrhythmias should be noted as both may require more invasive monitoring during surgery due to the effect of decreased cardiac preload and resulting acidosis from CO_2 resorption, respectively. Other important factors include neurologic or musculoskeletal disease, which may affect patient positioning at the time of surgery. A history of renal insufficiency is also important and may affect the choice of continent vs. incontinent urinary reconstruction [6].

The only absolute contraindications to RARC would include an uncorrected bleeding disorder, bowel obstruction, or presence of peritonitis or intra-abdominal abscess. However, as previously mentioned, individuals with severe pulmonary disease may not tolerate laparoscopic surgery and in some cases should forego this approach. While there are no absolute contraindications to RARC in terms of previous surgeries, prior abdominal operations may pose a particular challenge to gaining intra-abdominal access. A good knowledge of the surgical history as well as all incisions will help dictate where the Veress needle should be placed. In some situations, the Hasson technique may be more appropriate.

Nutritional Status Evaluation

Nutritional deficiency is not an uncommon finding in cancer patients and may have a significant impact on surgical outcomes. Gregg et al. retrospectively reviewed a cohort of over 500 patients who underwent radical cystectomy at a single institution. Patients with preoperative nutritional deficiency, defined as albumin <3.5 g/dl, body mass index <18.5, or preoperative weight loss over 5 %, had higher 90-day mortality rates (16.5 % vs. 5.1 %) and lower overall survival at 3 years (44.5 % vs. 67.6 %) compared to non-nutrient-deficient patients. After controlling for other variables, preoperative nutritional deficiency was associated with higher all cause mortality [7]. While the role of perioperative total parenteral nutrition or enteral feedings has not been completely defined, patients should be screened for these nutritional risk factors and perhaps evaluated by a dietician before surgery.

Patient Preparation

Patient preparation begins with a thorough discussion of the surgery and expectations both during the perioperative and postoperative period. Patients should be extensively counseled regarding the options for urinary reconstruction. For those patients who select an ileal conduit, it is helpful to provide them with an appliance to wear before surgery in order to become familiar with the appliance. Consultation with an enterostomal therapist is strongly advised in efforts to determine the optimal stoma site. In instances in which a stomal therapist is not available, it is imperative for the surgeon to mark the stoma on both the left and right sides in both the sitting and recumbent positions. Additional preoperative recommendations include smoking cessation which should always be encouraged as this has been shown to reduce the risk of postoperative complications [8]. Antiplatelet medications or nonsteroidal anti-inflammatory inhibitors should be held 7–10 days prior to surgery. Urinary tract infections should be treated with a test of cure prior to surgery.

Bowel Preparation

For many years a mechanical bowel preparation (MBP) with or without the use of oral antibiotics has been used in patients undergoing radical cystectomy and urinary reconstruction. However, the role of routine MBP has been challenged by many as causing more adverse effects than benefits [9]. Bowel preparation leads to dehydration and may cause electrolyte abnormalities and in several randomized controlled trials has shown a higher incidence of complications such as anastomotic leak, wound infection, and intra-abdominal abscess for those undergoing colorectal surgery [10]. While there have been no randomized controlled trials addressing MBP for radical cystectomy and urinary diversion, several retrospective studies have demonstrated no advantage of MBP [9, 11]. Given these findings we no longer routinely use a mechanical bowel preparation, and patients are only required to be nothing per os (NPO) after midnight the evening prior to surgery. Alternatively one may wish to administer a light bowel prep consisting of magnesium citrate the day prior to surgery, or a sodium phosphate enema the morning of surgery.

Intraoperative and Postoperative Care

Prior to induction of anesthesia, pneumatic compression devices should be placed. At our institution we also administer 5,000 units of heparin subcutaneously. Deep venous thrombosis (DVT) prophylaxis with heparin is continued throughout the hospital stay and has reduced our rates of thrombotic complications to 6.7 %. A second or third general cephalosporin is given intravenously within 1 h of incision and continued for 24 h based on the American Urological Association's best practice statement [12]. Alternatives include an aminoglycoside + metronidazole/clindamycin or fluoroquinolone. Orogastric or nasogastric tubes should always be placed for stomach decompression before obtaining abdominal insufflation. Patients are placed in the dorsal lithotomy position and great attention should be placed to all bony prominences and adequately padded prior to draping the patient. Skin hair should be removed with clippers in the operating room or in the holding area.

The routine use of postoperative nasogastric tube suction (NTS) is no longer implemented. A meta-analysis evaluating 33 randomized controlled trials involving over 5,000 patients undergoing abdominal surgery demonstrated an increased rate of both pulmonary complications and delayed return to bowel functions [13]. For radical cystectomy, NTS has shown to prolong hospital stay and delay time to return of bowel function [14, 15]. At present, NTS should only be used in selective cases, such as in the setting of bowel injury or those with a history of neurogenic bowel.

The use of a perioperative care pathways has been shown to reduce time to oral diet and discharge in patients undergoing radical cystectomy and have been highlighted in several high volume centers [15–17]. Key features include early NGT removal, use of chewing gum and pro-motility agent metoclopramide, pain control using non-opioid agents, and early implementation of a regular diet. Using these "fast-track" protocols, Pruthi et al. was able to demonstrate a reduced time to discharge with a mean of 5 days. At our institution, patients are started on a clear liquid diet on postoperative day 2 and then advanced to a regular diet after return of flatus. We emphasize early ambulation as well as minimizing opioid use for pain control. A bowel regimen, consisting of dulcolax and a stool softener is also started on hospital day 2.

Prior to discharge patients should receive appropriate education regarding care of orthotopic neobladder or ileal conduit. For those with orthotopic neobladder, patients should demonstrate proficiency in bladder irrigation and catheter care. Those whom have ileal conduit diversion should be comfortable with stoma care and appliance changes.

Conclusion

Robot-assisted radical cystectomy is a minimally invasive treatment for invasive or recurrent high-grade bladder cancer and may reduce postoperative pain and convalescence after surgery, both of which may reduce hospital stay. A thorough evaluation prior to surgery, including cardiac and pulmonary tests where appropriate is imperative to reduce significant complications. Mechanical bowel prep and routine nasogastric suction are not necessary and may prolong time to bowel function return. The implementation of routine clinical pathways has the potential advantage of further reducing hospital stay and recovery time.

Editors' Commentary

Erik P. Castle and Raj S. Pruthi

In recent decades the risks and complications of cystectomy and urinary diversion have been greatly reduced. Such improvements have come due to a variety of factors including improved operative techniques, superior anesthetic management, and evolved perioperative medical care.

One such measure to help improve outcomes and minimize morbidity of this procedure is the optimization of perioperative care—i.e., the use of clinical care pathways. The authors provide a "modern" and thoughtful approach to the perioperative management of patients undergoing radical cystectomy—whether open or robotic. Such evidence-based approaches to perioperative care have allowed the successful implementation of fast-track programs in a variety of operative procedures including colorectal surgery, hepatobiliary procedures, and cardiothoracic surgery. Indeed, cystectomy and urinary diversion may be particularly suitable to a structured care pathway given its potential for high morbidity (including postoperative ileus), potential for increased postoperative stay, and overall relatively high perioperative cost. Such clinical care pathways have the potential to utilize evidence-based modifications to reduce morbidity and improve recovery with regard to early institution of oral diet and early hospital discharge. Ongoing modification and analysis of this program remain an important aspect of clinical care pathways which provide a ready mechanism by which scientific evidence translates into clinical practice.

References

1. National Cancer Institute. SEER stat fact sheets: bladder. http://www.seer.cancer.gov/csr/1975_2009_pops09. Accessed May 2012.
2. Kim SP, Boorjian SA, Shah ND, Karnes RJ, Weight CJ, Moriarty JP, et al. Contemporary trends of in-hospital complications and mortality for radical cystectomy. BJU Int. 2012;110:1163–8. doi:10.1111/j.1464-410X. 2012.10990.x.
3. Kibel AS, Dehdashti F, Katz MD, Klim AP, Grubb RL, Humphrey PA, et al. Prospective study of [18F] fluorodeoxyglucose positron emission tomography/computed tomography for staging of muscle-invasive bladder carcinoma. J Clin Oncol. 2009;27(26):4314–20.
4. Grossman HB, Natale RB, Tangen CM, Speights VO, Vogelzang NJ, Trump DL, et al. Neoadjuvant chemotherapy plus cystectomy compared with cystectomy alone for locally advanced bladder cancer. N Engl J Med. 2003;349(9):859–66.
5. Gutt CN, Oniu T, Mehrabi A, Schemmer P, Kashfi A, Kraus T, et al. Circulatory and respiratory complications of carbon dioxide insufflation. Dig Surg. 2004;21(2):95–105.
6. World Health Organization Consensus Conference on Bladder Cancer, Hautmann RE, Abol-Enein H, Hafez K, Haro I, Mansson W, et al. Urinary diversion. Urology. 2007;69(1):17–49.
7. Gregg JR, Cookson MS, Phillips S, Salem S, Chang SS, Clark PE, et al. Effect of preoperative nutritional deficiency on mortality after radical cystectomy for bladder cancer. J Urol. 2011;185(1):90–6.
8. Theadom A, Cropley M. Effects of preoperative smoking cessation on the incidence and risk of intraoperative and postoperative complications in adult smokers: a systematic review. Tob Control. 2006;15(5):352–8.
9. Shafii M, Murphy DM, Donovan MG, Hickey DP. Is mechanical bowel preparation necessary in patients undergoing cystectomy and urinary diversion? BJU Int. 2002;89(9):879–81.
10. Bucher P, Mermillod B, Gerva P, Morel P. Mechanical bowel preparation for elective colorectal surgery: a meta-analysis. Arch Surg. 2004;139:1359–64.
11. Raynor MC, Lavien G, Nielsen M, Wallen EM, Pruthi RS. Elimination of preoperative mechanical bowel

preparation in patients undergoing cystectomy and urinary diversion. Urol Oncol. 2013;31:32–5.
12. Wolf JS, Bennett, CJ, Dmochowski RR, Hollenbeck BK, Pearle MS, et al. Best practice policy statement on urologic surgery antimicrobial prophylaxis. American Urologic Association. 2008. http://www.auanet.org/content/clinical-practice-guidelines/clinical-guidelines.cfm#2. Accessed May 2012.
13. Nelson R, Edwards S, Tse B. Prophylactic nasogastric decompression after abdominal surgery. Cochrane Database Syst Rev 2007;(3):CD004929.
14. Inman BA, Harel F, Tiguert R, Lacombe L. Routine nasogastric tubes are not required following cystectomy with urinary diversion: a comparative analysis of 430 patients. J Urol. 2003;170(5):1888–91.
15. Pruthi RS, Chun J, Richman M. Reducing time to oral diet and hospital discharge in patients undergoing radical cystectomy using a perioperative care plan. Urology. 2003;62(4):661–5.
16. Maffezzini M, Campodonico F, Canepa G, Gerbi G, Parodi D. Current perioperative management of radical cystectomy with intestinal urinary reconstruction for muscle-invasive bladder cancer and reduction of the incidence of postoperative ileus. Surg Oncol. 2008;17(1):41–8.
17. Pruthi RS, Nielsen M, Smith A, Nix J, Schultz H, Wallen EM. Fast track program in patients undergoing radical cystectomy: results in 362 consecutive patients. J Am Coll Surg. 2010;210(1):93–9.