Contemporary Preoperative and Intraoperative Management of the Radical Cystectomy Patient

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KEYWORDS

• Bladder cancer • Radical cystectomy • Preoperative optimization • Intraoperative optimization • Outcomes

KEY POINTS

- Smoking remains a key risk factor for muscle-invasive bladder cancer and despite often long smoking history, preoperative smoking cessation is necessary because it can contribute to better outcomes.
- Patient education remains crucial for this intensive surgery.
- Immunonutrition is an emerging area in surgery showing promise to reduce both early and late complications.
- Peripherally acting μ-opioid antagonists and avoidance of opioid-based analgesia promotes earlier return of bowel function.
- Restrictive intraoperative fluid administration significantly reduces transfusion requirements.

INTRODUCTION

Bladder cancer continues to be a prevalent, morbid, and lethal disease accounting for approximately 80,00 new cases per year and 16,000 deaths per year in the United states.[1] Of this number, approximately 15% to 20% of patients with bladder present with muscle-invasive bladder cancer,[2] which has significantly lower 5-year survival rates (47%) compared with non–muscle invasive disease (81%).[3] Radical cystectomy (RC) after neoadjuvant chemotherapy remains the standard of care in nonmetastatic muscle-invasive bladder cancer based on "Category I" evidence from randomized, controlled trials, where improved overall and disease-specific survival was observed.[4,5] This finding is true despite the increasing popularity of bladder-preserving regimens in which acceptable oncologic outcomes have been observed.[6]

RC is a morbid procedure often performed on a high-risk population. In 1 large cohort, 75% of patients who underwent RC were classified as high risk, as defined by Association of Anesthesiologist score of 3 or 4.[7] Furthermore, RC has been shown to have 90-day complication rates of 64%[8] and

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90-day mortality rates between 6% and 9%.[9,10] Furthermore, association has been observed between hospital-acquired adverse events and odds of in-hospital death, duration of stay, and total cost.[11] Given the significant morbidity associated with RC, in addition to the emerging reality of transitioning from a traditional fee-for-service payment model to novel reimbursement structures, there has been an ever-growing focus on optimization of the RC patient. This trend is apparent in the development of numerous enhanced recovery pathways,[12–19] and also has been thoroughly highlighted in the context of perioperative care redesign by Matulewicz and colleagues.[20]

The purpose of this article is to discuss preoperative and intraoperative optimization of the RC patient to delineate features associated with high-quality care delivery as evidenced in the literature.

PREOPERATIVE MANAGEMENT

Patient Education

Patient optimization begins in the clinic setting with patient education, which has been known to improve outcomes across multiple surgical specialties, from reducing falls after total knee arthroplasty,[21] to increasing adherence to lifestyle modifications in bariatric surgery.[22] Not only should patient education expand beyond the traditional components of informed consent, but the patient should be an active participant in their care both for improvement of overall health, but also regarding specific components of RC and associated procedures.

Tobacco

Smoking represents the most important modifiable risk factor for bladder cancer. Rink and colleagues[23] observed that not only do past or current smokers account for approximately 80% of RC patients, but cumulative smoking exposure was associated with advanced tumor stages, lymph node metastasis, disease recurrence, and cancer-specific and overall mortality after RC. Although some evidence exists for nicotine as a mediator of chemoresistance,[24] a small retrospective cohort did not observe an association between smoking characteristics and response to neoadjuvant cisplatin-based chemotherapy, recurrence, or cancer-specific survival.[25] Although some evidence suggests that current smoking status affects competing mortality rather than cancer-specific mortality,[26,27] there remains significant value in smoking cessation for numerous aspects of health. In a Cochrane review of 13 randomized, controlled trials evaluating a smoking cessation intervention and surgical outcomes (including urologic surgery), brief interventions were neither associated with long-term smoking outcomes nor reduced postoperative complications. However, intensive interventions were observed to reduce postoperative complications (relative risk, 0.42; 95% confidence interval, 0.27–0.65).[25] Notably, this review included 1 trial where preoperative varenicline before elective noncardiac surgery was observed to increase abstinence from smoking at 3, 6, and 12 months postoperatively.[28]

Alcohol

Although hazardous drinking is not known to be a specific risk factor for bladder cancer, preoperative alcohol use has been associated with increased complications after surgery, including postoperative infections, cardiopulmonary complications, and bleeding episodes.[29] A 2012 Cochrane Review included 2 randomized, controlled trials where the authors used intensive alcohol cessation programs, one with disulfiram 800 mg twice weekly for 4 weeks preoperatively, and the other with disulfiram 400 mg twice weekly, plus a weekly motivational interview and a 24/7 support line. The review observed a significant reduction in overall complication rates (odds ratio, 0.22; 95% confidence interval, 0.08–0.61), although there was no reduction of in-hospital or 30-day mortality, nor a difference in duration of stay or postoperative alcohol use.[30] Notably, the STOP smoking and alcohol drinking before operation for bladder cancer trial (STOP-OP study; ClinicalTrials.gov, ID: NCT02188446) is a multiinstitutional, randomized clinical trial to investigate changes in smoking and alcohol-related postoperative complications after intervention programs. Interventions will be biochemically validated by blood, urine, and breath tests.[31] Results from this and other trials will further quantify the benefit of lifestyle modification before RC.

Urinary diversion

Clearly, urinary diversion education is a cornerstone of preoperative planning for either incontinent or continent urinary diversion. Decisions should be based on multiple patient-centered factors and with shared decision making with the clinical team. Once a decision is reached, self-care education is paramount to set realistic expectations and maximize postoperative quality of life, both short term and long term. In patients opting for conduit diversion, the Urostomy Education Scale is a validated educational and an assessment tool for developing a patient's skill level regarding changing a urostomy appliance.[32] Furthermore, it may not require specialized