Editorial Commentary

Perioperative mortality following radical cystectomy: the slippery slope of complications

Marc H. Nelson, Marcus L. Quek

Department of Urology, Loyola University Medical Center, Maywood, IL, USA

Correspondence to: Marcus L. Quek, MD, FACS. Professor of Urology, Loyola University Medical Center, 2160 South First Avenue, Maywood, IL, USA. Email: mquek@lumc.edu.

Provenance: This is an invited article commissioned by Section Editor Xiao Li (Department of Urology, Jiangsu Cancer Hospital & Jiangsu Institute of Cancer Research & Nanjing Medical University Affiliated Cancer Hospital, Nanjing, China).

Comment on: Mossanen M, Krasnow RE, Zlatev DV, *et al.* Examining the relationship between complications and perioperative mortality following radical cystectomy: A population-based analysis. BJU Int 2019;124:40-6.

Submitted Jan 08, 2019. Accepted for publication Feb 24, 2019.
doi: 10.21037/tau.2019.02.04
View this article at: http://dx.doi.org/10.21037/tau.2019.02.04

The confluence of disease burden, advanced age and comorbidities of patients, and an inherently morbid operation make patients undergoing radical cystectomy (RC) for bladder cancer particularly vulnerable. In a recent study by Mossanen *et al.* (1), the authors explore the effect of complications on mortality following radical cystectomy. The study uses the Premier Hospital Database, a hospital discharge database, to identify patients who underwent radical cystectomy for bladder cancer and concludes that the timing, quantity, and nature of complications affect mortality following surgery.

The authors find that overall 90-day mortality after RC is 3.4%, in line with prior literature (2), and reveal that mortality increases exponentially with increased number of complications. As described, the odds ratio of postoperative mortality, referenced to those with an uncomplicated course, ranged from 6.3 for patients with a single postoperative complication to 76.6 for those with greater than four postoperative complications.

Furthermore, the study reveals that complications at the time of readmission appear to have a greater effect on patient survival as compared to those that occur in the immediate perioperative period. They found that a single complication at (or requiring) readmission effectively doubled the risk of mortality, as compared to a single complication in the immediate postoperative period. Pulmonary, cardiac, and renal complications were consistently associated with decreased survival.

The aforementioned results serve as a basis for a thorough discussion regarding modifiable patient risk factors within the RC population. Augmentation of lean muscle mass with diet, pharmacologic therapy (i.e., steroids) or exercise programs may also reduce frailty-associated morbidity (3). "Prehabilitation" programs are an area of active study within this cohort (4). Enhanced recovery after surgery (ERAS) protocols, first popularized within the colorectal surgery literature, contain a variety of pre-, intra-, and post- operative elements that, in aggregate, have been shown to reduce perioperative morbidity and length of stay after institutional implementation (5,6). Recently, institutional preoperative screening and treatment for Clostridium Difficile infection (CDI) was observed to reduce postoperative CDI (7). There is also emerging evidence that surgical technique (i.e., robotic technique) may reduce blood loss and transfusions, and length of hospitalization as compared to open (8).

Early identification and treatment of postoperative complications is also hypothesized to minimize harmful effects of such morbidity, therefore halting the so-called "downward spiral" or "slippery slope" in which one complication begets another which begets another, leading to a prolonged postoperative course and higher risk for mortality. While complication rates following major surgery appear to be independent of hospital volume, failure to rescue (i.e., death following major complication) is directly associated with hospital volume and may be a

surrogate for hospital quality (9). Improved methods for outpatient monitoring may also allow for earlier diagnosis of complications.

The authors do a commendable job addressing several limitations that are inherent to retrospective database studies, including implicit biases and dependence on accurate coding. Additionally, the database is limited to inpatient encounters and does not allow for assessment of complications managed on an outpatient basis, and how this may affect the patient's clinical trajectory. Furthermore, the notable absence of data regarding administration of neoadjuvant chemotherapy is disclosed.

Ultimately, this study quantifies and confirms what urologists implicitly understand: minimizing and early identification of complications after cystectomy is paramount to halting the "slippery slope" and improve survival. In addition to meticulous attention to surgical technique, continued efforts are needed to identify and ameliorate the modifiable patient risk factors that may negatively impact perioperative mortality. Prevention of complications remains the best and most cost-effective method to improve outcomes following radical cystectomy.

Acknowledgments

None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

References

1. Mossanen M, Krasnow RE, Zlatev DV, et al. Examining the relationship between complications and perioperative mortality following radical cystectomy: A population-based analysis. BJU Int 2019;124:40-6.
2. Aziz A, May M, Burger M, et al. Prediction of 90-day mortality after radical cystectomy for bladder cancer in a prospective European multicenter cohort. Eur Urol 2014;66:156-63.
3. Psutka SP, Carrasco A, Schmit GD, et al. Sarcopenia in patients with bladder cancer undergoing radical cystectomy: impact on cancer-specific and all-cause mortality. Cancer 2014;120:2910-8.
4. Hijazi Y, Gondal U, Aziz O. A systematic review of prehabilitation programs in abdominal cancer surgery. Int J Surg 2017;39:156-62.
5. Cerantola Y, Valerio M, Persson B, et al. Guidelines for perioperative care after radical cystectomy for bladder cancer: Enhanced Recovery After Surgery (ERAS®) society recommendations. Clin Nutr 2013;32:879-87.
6. Pang KH, Groves R, Venugopal S, et al. Prospective Implementation of Enhanced Recovery After Surgery Protocols to Radical Cystectomy. Eur Urol 2017. [Epub ahead of print].
7. Calaway AC, Jacob JM, Tong Y, et al. A Prospective Program to Reduce the Clinical Incidence of Clostridium difficile Colitis Infection after Cystectomy. J Urol 2019;201:342-9.
8. Parekh DJ, Reis IM, Castle EP, et al. Robot-assisted radical cystectomy versus open radical cystectomy in patients with bladder cancer (RAZOR): an open-label, randomised, phase 3, non-inferiority trial. Lancet 2018;391:2525-36.
9. Ghaferi AA, Birkmeyer JD, Dimick JB. Hospital volume and failure to rescue with high-risk surgery. Med Care 2011;49:1076-81.

Cite this article as: Nelson MH, Quek ML. Perioperative mortality following radical cystectomy: the slippery slope of complications. Transl Androl Urol 2019;8(Suppl 3):S289-S290. doi: 10.21037/tau.2019.02.04

