

Enhanced Recovery Protocol after Radical Cystectomy for Bladder Cancer

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Abbreviations and Acronyms

ERAS = enhanced recovery after surgery

LOS = length of hospital stay

POD = postoperative day

POI = postoperative ileus

RC = radical cystectomy

TPN = total parenteral nutrition

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Purpose: Enhanced recovery after surgery protocols aim to improve patient care and decrease complications and hospital stay. We evaluated our enhanced recovery after surgery protocol, focusing on length of stay, early complication and readmission rates after radical cystectomy for bladder cancer.

Materials and Methods: From May 2012 to July 2013 a perioperative protocol was applied in 126 consecutive patients who underwent open radical cystectomy and urinary diversion. Nonconsenting patients (2), those with previous diversion (2) and prolonged postoperative intubation (3), and those who underwent additional surgery (9) were excluded from study. The protocol focuses on avoiding bowel preparation and nasogastric tube, early feeding, nonnarcotic pain management and the use of cholinergic and μ -opioid antagonists. Outcomes were compared to those in matched controls from our bladder cancer database.

Results: A total of 110 patients with a median age of 69 years were included in analysis, of whom 68% underwent continent urinary diversion. Of the patients 82% had a bowel movement by postoperative day 2. Median length of stay was 4 days. The 30-day minor and major complication rates were 64% and 14%, respectively. The most common minor complication was anemia requiring transfusion in 19% of patients, urinary tract infection in 13% and dehydration in 10%. The latter 2 complications were the most common etiologies for readmission. The 30-day readmission rate was 21% (23 patients). Patients 75 years old or older had a longer length of stay (5 vs 4 days, $p = 0.03$) and a higher minor complication rate (72% vs 51%, $p = 0.04$) than younger patients.

Conclusions: Our enhanced recovery after surgery protocol expedites bowel function recovery and shortens hospital stay after RC and urinary diversion without an increase in the hospital readmission rates.

Key Words: urinary bladder, urinary bladder neoplasms, cystectomy, patient readmission, recovery of function

RADICAL cystectomy, the gold standard treatment for muscle invasive bladder cancer, is among the most complex urological operations and it is associated with considerable morbidity and lengthy hospital stay.¹ Improvements in surgical technique,

anesthesia and perioperative care have decreased morbidity and LOS, although the mean stay at most centers is still as high as 9 to 11 days.¹⁻³ The mean stay in a recent European series was 17.4 days.⁴ A population based study and a prospective,

randomized trial comparing open vs robotic RC revealed no significant difference in the overall complication rate⁴ or LOS,^{4,5} suggesting that perioperative management may have more impact than surgical approach.

ERAS protocols are evidence-based multimodal pathways that optimize the perioperative care of patients undergoing complex surgeries. The goal is to promote acute recovery as demonstrated by decreased LOS with no negative impact on the complication or readmission rate. ERAS protocols, first introduced in patients undergoing colectomy, include perioperative changes in management, including reduced preoperative fasting and early postoperative feeding.⁵ Results showed decreased postoperative complications and faster recovery.⁶

There is limited adoption of ERAS protocols for major urological surgeries such as RC. This is most likely multifactorial and may include persistent surgical dogma and/or the belief that urinary diversion is a more complex operation than colorectal surgery with a higher incidence of gastrointestinal complications.⁷ The main reason for prolonged LOS after cystectomy remains gastrointestinal morbidity, mostly paralytic ileus.⁸ Previous investigators described standardized perioperative care for patients treated with RC with some reduction in LOS.^{7,9–13} We describe our ERAS protocol after RC and urinary diversion, focusing on LOS, and readmission and complication rates.

MATERIALS AND METHODS

Study Population

All consecutive patients who underwent open RC, pelvic node dissection and urinary diversion from May 2012 to July 2013 at our institution were enrolled in a prospective, institutional review board approved study. Patients who needed an adjunctive procedure (ie nephroureterectomy) or who remained intubated postoperatively and could not be started on oral feeding per protocol were excluded from analysis. The ERAS protocol was designed to be applied at 3 time points (see Appendix).

Preoperative

Patients were advised to continue a regular diet up to the night before surgery. A high protein, high carbohydrate supplement was recommended the day before surgery. No bowel preparation was used unless urinary diversion involving part of the large bowel was planned preoperatively, in which case only mechanical bowel preparation was recommended. An antibiotic was started intravenously just before the operation and continued for 24 hours.

Intraoperative

The peripherally acting μ -opioid antagonist alvimopan was started an hour preoperatively. Intraoperative fluid

intake was minimized while the ureters were clipped. Intravascular fluid volume was monitored by stroke volume or central venous pressure. No epidural analgesia was used. Intravenous acetaminophen acetate was started intraoperatively and narcotic use was kept to a minimum. The nasogastric tube was removed at the end of surgery and the patient was extubated unless medically recommended to remain intubated. The patient was transferred to the floor unless there was a medical indication for admission to the intensive care unit.

Postoperative

Bowel function. Alvimopan was continued postoperatively. Neostigmine was also administered under cardiac monitoring. Neostigmine and alvimopan were discontinued after the patient achieved a bowel movement. Oral magnesium based lactulose or bisacodyl suppository was started on POD 1. Prophylaxis for stress ulcers (proton pump inhibitor and H₂ receptor blocker) and nausea/vomiting (ondansetron and/or metoclopramide) was administered regularly. Patients were encouraged to ambulate starting on POD 1.

Diet and fluid intake. Patients were started on sips of liquid early after surgery if it was tolerated. On POD 1 a clear liquid diet was started and gradually increased. A regular diet was started on POD 2 in the absence of nausea, vomiting or abdominal distension with a concomitant decrease in intravenous fluid intake. If patient did not tolerate oral food by POD 6 or 7, parenteral feeding was started.

Pain management. Intravenous ketorolac tromethamine and acetaminophen acetate were the mainstays of postoperative pain management unless contraindicated. Paraincisional subfascial catheters with constant local anesthesia release were also used for local pain control. Oral painkillers were started on POD 1 and most patients were transitioned to oral medication by POD 3. Oral opioid pain medication (oxycodone) was reserved for breakthrough pain.

Discharge and Followup

Patients and caregivers received training at a preoperative educational class and before discharge home. Discharge criteria included 1) adequate pain control, 2) adequate mobility with catheter or stoma care, 3) normal laboratory results, 4) adequate oral intake (1 or more L per day) and 5) bowel movement. In addition, a prophylactic antibiotic was started and continued for 3 weeks or until catheter removal. Starting with patient 25 alkalization was also added to the protocol if discharge bicarbonate was less than 22 mmol/L. Patients received heparin injections for deep vein thrombosis prophylaxis during hospitalization. Starting with patient 95 the patients were sent home on low molecular weight heparin until POD 28.

Patients were scheduled to return to the clinic 1 week after discharge for the first postoperative visit. To ensure adequate hydration it was arranged for patients to receive a 1 L bolus of intravenous fluid every other day at home or at the nursing facility depending on patient placement after hospital discharge.

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