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Elimination of preoperative mechanical bowel preparation in patients undergoing cystectomy and urinary diversion

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Abstract

Introduction: The utility of a preoperative mechanical bowel preparation prior to bowel surgery has recently been questioned. The purpose of this study is to compare the perioperative outcomes between patients undergoing cystectomy with urinary diversion with or without preoperative mechanical bowel preparation.

Methods: Seventy patients underwent radical cystectomy and urinary diversion between May 2008 and August 2009 for bladder cancer. The first cohort of patients ($n = 37$) underwent cystectomy and diversion during the period May 2008–December 2008 and underwent a preoperative mechanical bowel preparation including a clear liquid diet, magnesium citrate solution, and an enema before surgery. The second cohort of patients underwent surgery during the period of January 2009–August 2009 ($n=33$). These patients were given a regular diet before surgery and did not undergo a mechanical bowel preparation except for the enema before surgery was performed to decrease rectal/colonic distention. Outcome measures included gastrointestinal and overall complications, and perioperative outcomes including recovery of bowel function.

Results: There were no differences with regard to recovery of bowel function, time to discharge, or overall complication rates between the 2 groups. More specifically, the rate of GI complications was not different in prepped patients vs. nonprepped patients (22% vs. 15%; $P = 0.494$). There were no occurrences of bowel anastomotic leak, fistula, abscess, peritonitis, or surgical site infection in either group. One perioperative death occurred in the nonprepped group secondary to cardiovascular complications.

Conclusions: Preoperative mechanical bowel preparation prior to radical cystectomy with urinary diversion does not demonstrate any significant advantage in perioperative outcomes, including gastrointestinal complications. Further studies aimed at measuring patient satisfaction and larger randomized trials will be beneficial in evaluating the role of mechanical bowel preparation prior to urinary diversion.

Keywords: Urothelial carcinoma; Bladder cancer; Cystectomy; Bowel preparation; Urinary diversion

1. Introduction

Recently, the utility of a preoperative mechanical bowel preparation prior to bowel surgery has been questioned. The routine use of mechanical and antibiotic bowel preparation prior to intestinal surgery was previously considered a standard practice and was initially purported to reduce the risk of infectious complications and anastomotic leakage [1]. This was thought to be accomplished through reduction of fecal mass and decreased bacterial count in the bowel lumen. However, recent literature suggests no significant benefit from preoperative bowel preparation [2]. One smaller randomized trial found an increase in abdominal infectious complications in patients who underwent mechanical bowel preparation [3]. However, this study only included 153 patients. Contant et al. evaluated 1,354 patients randomized to mechanical bowel preparation or no bowel preparation prior to elective colorectal surgery [4]. No significant difference was found in the rates of anastomotic leakage between the 2 groups. However, patients who underwent mechanical bowel preparation had fewer occurrences of abdominal abscesses after anastomotic leakage than patients who did not undergo bowel preparation. Several meta-analyses have examined the role of mechanical bowel preparation and no significant benefit has been found with the

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addition of bowel preparation regarding rates of anastomotic leakage or abdominal abscess [5–7].

Literature regarding elimination of mechanical bowel preparation in urologic surgery is limited. In fact, only 2 previous studies have examined the role of mechanical bowel preparation prior to urinary diversion [8,9]. In these studies, there was no benefit to preoperative mechanical bowel preparation. Additionally, bowel preparation may pose adverse risk to the patient and likely affect patient satisfaction and quality of life. The purpose of this study is to compare the perioperative outcomes between patients undergoing cystectomy with urinary diversion with or without preoperative mechanical bowel preparation.

2. Materials and methods

In accordance with the principles and practices of the University of North Carolina Institutional Review Board (IRB) and in recognition of and compliance with HIPAA guidelines (United States Health Insurance Portability and Accountability Act of 1996), a retrospective review was performed of our bladder cancer database and identified 70 consecutive patients who underwent a radical cystectomy and urinary diversion for clinically-localized urothelial carcinoma of the bladder from June 2008 to August 2009.

The first cohort of patients included those who underwent cystectomy with urinary diversion between May 2008 and December 2008, and received a preoperative mechanical bowel preparation ($n = 37$). Preoperative bowel preparation included clear liquid diet for 24 hours prior to surgery and oral magnesium citrate solution (8 oz). Patients were also administered an enema 2 hours prior to surgery. (Of note, oral antibiotic preparation was not utilized in this group.)

In comparison, the second cohort of patients underwent radical cystectomy and diversion between January 2009 and August 2009 in which preoperative mechanical bowel preparation was eliminated ($n = 33$). These patients were instructed to maintain a normal diet on the day prior to surgery. Patients in this group did not receive any oral, mechanical, or antibiotic preparation except for an enema 2 hours prior to surgery to decrease rectal/colonic distention prior to pelvic surgery.

Of note, all patients received perioperative intravenous antibiotics for 24 hours before skin incision. Also, patients were excluded from either group if there was a history of prior abdominal or pelvic radiation or prior complicated bowel surgery (previous bowel resection, colostomy, etc.).

Primary outcome measures included postoperative gastrointestinal or abdominal complications. Specifically, these measures included the rates of anastomotic leak, peritonitis, abdominal abscess, fistula, small bowel obstruction (SBO), ileus, emesis, fascial dehiscence, hernia, or surgical site infection. Secondary outcome measures included estimated surgical blood loss (EBL), operative time (OR time), time to flatus (recorded as postoperative day), time to bowel movement (BM) (recorded as postoperative day), time to hospital discharge (recorded as postoperative day), complications including those occurring during hospitalization and during the first 30 days after discharge, including all readmissions. Postoperative complications were classified according to the Clavien-Dindo classification of surgical complications [10].

Comparisons between these 2 groups were made utilizing the Student's *t*-test for continuous variables and chi-square analysis for categorical measures. Statistical analysis was performed using the SAS ver. 9 system (SAS Inc., Cary, NC).

3. Results

Patient demographic data are listed in Table 1. Postoperative gastrointestinal or abdominal complications occurred in 8 patients in group 1 ("prep" group) and 5 patients in group 2 ("no prep" group) (21.6% vs. 15.1%; $P = 0.494$). In group 1, there were 2 cases of postoperative emesis, 3 instances of postoperative ileus, 1 partial SBO, 1 fascial dehiscence requiring surgical exploration, and 1 postoperative incarcerated inguinal hernia requiring repair. In all cases of ileus or SBO, patients recovered with conservative management only. In group 2, there were 2 cases of emesis, 1 partial SBO, 1 postoperative ileus, and 1 fascial dehiscence requiring operative exploration. Again, all cases of emesis, ileus, or SBO resolved with conservative management. There were no occurrences of bowel anastomotic leak, fistula, abscess, peritonitis, or surgical site infection in either group.

Estimated blood loss, OR time, time to flatus, time to BM, and length of hospital stay did not differ between the 2 groups (Table 2). Overall, complications occurred in 12 patients in group 1 and 14 patients in group 2 (32.4% vs. 42.4%, $P = 0.395$) (see Table 3). There were 2 cases of Clavien Grade 3–5 complications in each group. In group 1, there was 1 fascial dehiscence and 1one incarcerated inguinal hernia both which required reoperation. In group 2, there

Table 1
Patient demographics

	Prep	No prep
Patients	37	33
Male	31	23
Female	6	10
Age (range)	68.6 (33–88)	65.8 (44–87)
ASA	2.8	2.7
BMI	28.5	26.1
Type of procedure		
Robot-assisted	17	16
Open	20	17
Type of diversion		
Neobladder	7	7
Ileal conduit	30	26