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Incidence and risk factors for urinary retention following laparoscopic inguinal hernia repair

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Abstract

BACKGROUND: The incidence of postoperative urinary retention (PUR) has been reported to range from 1% to 22% in patients who have undergone laparoscopic inguinal hernia procedures. The objectives of this study were to determine the incidence of PUR and examine different risk factors that may be associated with the development of PUR in patients who have undergone laparoscopic inguinal hernia procedures.

METHODS: A retrospective chart review was performed on 350 patients. Demographics, comorbidities, and operative and postoperative information were collected in patients undergoing laparoscopic inguinal hernia repair by 3 general surgeons from 2007 to 2011. Statistical analysis was done on patient demographics, medical histories, anesthesia notes, and postoperative notes to identify risk factors for the development of urinary retention after laparoscopic inguinal hernia repair.

RESULTS: Three hundred fifty consecutive patients who underwent laparoscopic inguinal hernia repairs were reviewed. Twenty-nine patients developed PUR, an incidence of 8.3%. Age $\geq$60 years and history of benign prostatic hyperplasia showed significance on multivariate analysis, with odds ratios of 3.0 and 11.0 respectively ($P < .05$). Anesthesia time $\geq$2 hours (odds ratio, .75) was a contributing perioperative risk factor but only as an independent risk factor ($P < .05$).

CONCLUSIONS: History of benign prostatic hyperplasia, age $\geq$60 years, and anesthesia time $\geq$2 hours were significant independent risk factors for urinary retention after laparoscopic inguinal hernia repair. On multivariate analysis, only history of group and age $\geq$60 years showed significance. This is 1 of the largest studies to show that the development of PUR in laparoscopic inguinal hernia repair patients is a multifactorial process. Further studies should be conducted to corroborate our findings.

Inguinal hernias are the most common type of hernias, with approximately 700,000 treated on an annual basis in the United States, making this 1 of the most frequently performed operations in general surgery, accounting for about 10% of all general surgery procedures.[1,2] The incidence of postoperative urinary retention (PUR) has been reported to range from 1% to 22% of patients who have undergone laparoscopic inguinal hernia procedures.[3–6] Laparoscopic inguinal hernia repairs are routinely performed as outpatient procedures; however, the development of PUR prevents same-day discharge in a considerable proportion of this population. Patients experiencing PUR spend more time in recovery, and some patients return to the emergency department after being discharged for an inability to void, all of which leads to increased medical costs. The

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objectives of this study were to determine the incidence and examine different risk factors that may be associated with the development of PUR in patients who have undergone laparoscopic inguinal hernia procedures.

Methods

After obtaining institutional review board approval, a retrospective chart review was performed on 350 patients. Demographics, comorbidities, and operative and postoperative information were collected from patients who underwent laparoscopic inguinal hernia repairs by 3 general surgeons at Mount Sinai Medical Center from 2007 to 2011. Predictors and risk factors for the development of PUR in patients undergoing laparoscopic inguinal hernia procedures were determined using univariate and multivariate logistic regression analysis (SPSS version 18.0; SPSS, Inc, Chicago, IL). Variables to be tested against the dependent variable (urinary retention) were selected using chi-square tests for categorical variables and *t* tests for continuous variables. Risk factors for the development of urinary retention in patients undergoing laparoscopic inguinal hernia procedures were deemed significant at $P < .05$.

Results

Patient demographics of the study population (n = 350) are as follows. The average age was 48.7 years, 92% were men (n = 322), and 8% were women (n = 28). Seventy-eight percent of the procedures (n = 273) were bilateral laparoscopic inguinal hernia repairs, and 22% (n = 77) were unilateral repairs. In terms of race, 45% were Caucasian, 28% were Hispanic, 19% were African American, and 8% were identified as of other races. The mode for American Society of Anesthesiologists class in the patient population was class II (n = 221). None of the repairs were converted to open procedures.

PUR was defined as the inability to void after laparoscopic inguinal hernia surgery requiring catheterization after a void trial of a period of 5 to 8 hours. In this study, 29 patients developed PUR, making the incidence at our institution 8.3%. Table 1 demonstrates demographic and operative information in patients who developed urinary retention compared with those patients who did not. All patients who developed PUR retention were men. In terms of race, 76% were Caucasian (n = 22), 10% were Hispanic (n = 3), 7% were African American (n = 2), and 7% were identified as of other races (n = 2). Eighty percent (n = 23) were bilateral procedures and 20% (n = 6) were unilateral. The average age was 57.6 years (range, 25 to 85 years). The mode for American Society of Anesthesiologists class was class II (n = 19). Average anesthesia time was 147 minutes in the population of patients who developed urinary retention. Five patients were discharged home on the day of surgery and readmitted to the hospital the next day for inability to void. Six patients had histories of voiding problems, 12 had a history of benign prostatic hyperplasia (BPH), and 4 had histories of prostate cancer. The average volume of urine voided after catheterization was 492 mL. All patients who developed PUR were initially managed with single-shot catheterization. Continued drainage was defined as catheterization with a residual of >250 mL of urine. All patients were either observed overnight or discharged on the day of surgery with a catheter. Those admitted as inpatients stayed overnight, and void trial was done on postoperative day 1. A total of 9 patients were managed in this fashion. If they failed, in early morning they were discharged with Foley catheters with follow-up and void trial with the urologist between postoperative days 3 and 5. Four patients failed void trial and were sent home with Foley catheters and seen by a urology service postoperatively.

Table 1 Demographic and perioperative data in patients with and those without PUR

Variable	Patients with PUR	Patients without PUR
Demographics		
Average age (y)	49.7	57.6
Gender		
Male	96.5% (310)	100% (29)
Female	3% (11)	0% (0)
ASA class, mode	II (n = 287)	II (n = 19)
Medical history		
BPH	5.6% (18)	41% (12)
Prostate cancer	3.7% (12)	14% (4)
Diabetes mellitus	26% (85)	17% (5)
Perioperative data		
Site of hernia		
Bilateral	83% (266)	80% (23)
Unilateral	17% (55)	20% (6)
Average anesthesia time (min)	117	147
Average operative time (min)	73	92
Intraoperative Foley catheter use	100% (321)	100% (29)
Average LOS (d)	58	1.27
Intraoperative complications	0	0

ASA = American Society of Anesthesiologists; BPH = benign prostatic hyperplasia; LOS = length of stay; PUR = postoperative urinary retention.

Logistic regression analysis was performed to examine predictive factors for the development of PUR, which included demographic variables, medical histories, and certain perioperative factors. Variables such as sex, site of hernia (unilateral vs bilateral), body mass index, type of hernia (primary vs recurrent), transabdominal preperitoneal versus total extraperitoneal, indirect versus direct, and mesh type were not significant predictors of PUR. Among patients who developed PUR, all had received general anesthesia, and 8 patients were given additional local anesthetic before incision (Table 2). Among patients who