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Spinal anesthesia increases the rate of opioid-free recovery after transurethral urologic surgery



Transurethral resection of the prostate (TURP) or of a bladder tumor (TURBT) are common operations [1]. These surgeries can be performed under general or spinal anesthesia, and older studies demonstrate no difference in major outcomes based on anesthetic technique [2,3]. Recently, there has been increasing interest in “opioid-free” anesthesia and surgery [4] in light of the current opioid epidemic and surgery’s known association with persistent opioid use [5]. Thus, we sought to determine whether or not anesthetic technique affects the rate of opioid-free recovery after surgery or other early postoperative outcomes in patients undergoing TURP or TURBT in contemporary practice.

After Veterans Affairs (VA) research committee and institutional review board approval with waiver of informed consent, we retrospectively identified all TURP or TURBT patients with inpatient admission between January 2013 and September 2018 at a single VA hospital using an internal database and electronic chart review (Picus Clinical Solutions, Inc., Wakefield, MA, USA). We excluded patients if they had outpatient surgery, incomplete medical records, conversion of anesthetic technique, or cancellation. In the case of multiple surgeries, subsequent procedures within 30 days of the index procedure were excluded.

The rate of opioid-free recovery was the primary outcome and defined as not receiving any opioid in the PACU. All spinal patients received bupivacaine intrathecally so we assumed intraoperative differences in opioid use. We also collected PACU maximum patient-reported pain score (0–10 numeric pain rating scale, 0 = no pain; 10 = worst possible pain), PACU antiemetic requirement, patient body temperature on arrival to PACU, PACU and hospital length of stay, major 30-day complications (neurologic, cardiovascular, respiratory, renal, infectious, surgical site complications, transfusion requirements, or death), need for escalation of care (i.e., admission to intensive care), and return to the emergency department and/or hospital readmission within 30 days. We collected baseline patient characteristics such as age, sex, height, weight, body mass index (BMI), American Society of Anesthesiologists physical status (ASA PS), and procedure type.

Comparisons between the general and spinal groups were made using the Wilcoxon rank-sum, chi square, or Fisher’s exact test as appropriate. Multivariable linear regression models were used to adjust for potential confounders within baseline patient characteristics for maximum PACU pain score. Data were analyzed using SAS version 9.3 (SAS Institute Inc., Cary, NC, USA); $p < 0.05$ was considered statistically significant.

Initially 248 TURP or TURBT patients within the study period were identified. Two hundred thirty-six patients were included in the final analysis (152 general, 84 spinal) after excluding patients with incomplete records ($n = 7$), repeat procedure within 30 days ($n = 2$), cancellation ($n = 1$), and spinal conversion to general ($n = 2$). There were no differences in baseline characteristics between groups. More patients who underwent TURP (57/137 or 42%) received a spinal compared to TURBT patients (27/99 or 27%; $p = 0.03$).

Patient who received a spinal for TUR surgery had a higher rate of opioid-free recovery (65/84 or 77%) when compared to general anesthesia (80/152 or 53%; $p < 0.01$). Spinal patients had maximum PACU pain scores [median (IQR)] of 0 (0–0) vs. 2 (0–6) for general ($p < 0.01$), and 83% of patients who received spinal anesthesia (70/84) reported maximum pain scores < 4 compared to 56% (85/152) of general anesthesia patients ($p < 0.01$). There were no differences in other outcomes (Table 1). After forcing age, BMI, and ASA PS into the multivariable linear regression model, the difference between spinal and general anesthesia in terms of maximum PACU pain score persisted.

In summary, this contemporary study shows that spinal anesthesia is associated with a higher rate of opioid-free recovery following TURP or TURBT and lower maximum PACU pain scores when compared with general anesthesia.

Declaration of competing interest

This study was not funded. None of the authors has any conflicts of interest to declare.

Table 1
Postoperative outcomes.

	GA (n = 152)	SA (n = 84)	p-Value
PACU			
Minimum pain score	0 (0–0)	0 (0–0)	0.09
Antiemetic free	141 (93%)	77 (92%)	0.96
Arrival temperature (°C)	36.3 (36.2–36.7)	36.4 (36.2–36.7)	0.78
PACU length of stay (hours)	1.6 (1.2–2.1)	1.5 (1.1–2.1)	0.73
Hospital			
Hospital length of stay (days)	1 (1–2)	1 (1–2)	0.40
Escalation of care	4 (2.6%)	1 (1.2%)	0.79
30-day postoperative period			
Return to emergency department	8 (5.3%)	3 (3.6%)	0.79
Hospital readmission	5 (3.3%)	4 (4.8%)	0.83
Neurologic complications	1 (0.7%)	0 (0.0%)	0.99
Cardiovascular complications	1 (0.7%)	1 (1.2%)	0.75
Respiratory complications	0 (1.3%)	0 (0.0%)	0.99
Renal complications	1 (0.7%)	1 (1.2%)	0.75
Infectious complications	0 (0.0%)	1 (1.2%)	0.36
Surgical site complications	0 (0.0%)	1 (1.2%)	0.36
Requiring transfusion	1 (0.7%)	1 (1.2%)	0.75
Death	1 (0.7%)	0 (0.0%)	0.99

Data reported as median (IQR) or n (%); PACU = postanesthesia care unit; GA = general anesthesia; SA = spinal anesthesia.

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