

Anesthetic Management in Emergency Urological Surgeries: A Retrospective Analysis of 110 Cases

Nurettin KURT  

Department of Anesthesiology and Reanimation, Van Yüzüncü Yıl University Faculty of Medicine, Van, Türkiye

Background: Emergency urological conditions are frequently encountered in clinical practice; however, only a small proportion require urgent surgical intervention. Data regarding anesthesia management in these cases remain limited. The study aimed to evaluate anesthesia methods, characteristics, comorbidities, and surgical durations in emergency urological surgeries.

Materials and Methods: This retrospective study included 110 patients aged 18–82 years who underwent emergency urological surgery between 2020 and 2022. Data were obtained from hospital information systems and patient records. Patients with incomplete data were excluded. Demographic characteristics, ASA scores, surgical indications, anesthesia methods, and operative durations were analyzed.

Results: The mean age was 41.5 ± 15.9 years, and 89.1% were male. ASA I, II, and III were observed in 57.9%, 27.4%, and 14.7% of patients, respectively. The common surgical indications were ureteral calculi (47.3%), testicular tumor (20%), penile fracture (13.6%), testicular torsion (11.8%), and Fournier's gangrene (7.3%). Spinal anesthesia was the commonly used technique (79.1%), followed by anesthesia (19.1%) and sedoanalgesia (1.8%). The mean duration of surgery was 54.9 ± 18.5 minutes. No major complications or postoperative ICU requirements were observed.

Conclusion: Regional anesthesia techniques, particularly spinal anesthesia, can be safely and effectively used in emergency urological surgeries in appropriately selected patients.

Keywords: Urological emergencies, anesthesia management, spinal anesthesia, ureteral calculi, testicular torsion

Introduction

Emergency urological conditions represent a significant portion of admissions to emergency departments, although only a minority require surgical intervention. Conditions such as testicular torsion, ureteral obstruction due to calculi, penile fracture, and Fournier's gangrene require prompt diagnosis and immediate surgical management to prevent irreversible morbidity (1, 2).

Effective management of the patients requires close collaboration between emergency medicine, urology, and anesthesiology teams. Despite the clinical importance of anesthesia choice in emergency settings, there is limited literature focusing on anesthetic approaches in emergency urological surgeries (3, 4). Regional anesthesia techniques have gained popularity due to their advantages, including reduced systemic effects, better postoperative analgesia,

Corresponding Author: Nurettin KURT, Associate Professor;
Department of Anesthesiology and Reanimation, Van
Yüzüncü Yıl University Faculty of Medicine, Van, Türkiye
E-mail: dr.nurettinkurt@gmail.com
ORCID: 0000-0001-7713-5120

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and lower complication rates in selected patients. However, evidence regarding their use in emergency urological procedures remains insufficient (5, 6).

This study aimed to evaluate anesthesia methods, patient characteristics, surgical indications, and perioperative outcomes in patients undergoing emergency urological surgeries.

Materials and Methods

Ethical approval was obtained from the Clinical Research Ethics Committee of Van Yüzüncü Yıl University Faculty of Medicine (Decision No: 2022/09-08, Date: September 09, 2022) prior to the study. In this retrospective study, patients aged 18–100 years who underwent emergency urological surgery at Van Yüzüncü Yıl University Faculty of Medicine Hospital between January 2020 and December 2022 were evaluated.

Patient data were obtained from follow-up forms and the hospital management system, and subsequently analyzed. Patients with complete data who underwent surgery were included in the study. Patients with incomplete or missing data, those who received local anesthesia, and those who underwent revision surgery were excluded. As a result of the data review, a total of 110 patients aged between 18 and 82 years, for whom informed consent had been obtained, were included in the analysis. Demographics, anesthetic techniques, surgical indications, physical status classification, perioperative complications, American Society of Anesthesiologists (ASA), morbidity, and postoperative intensive care unit requirements were systematically analyzed.

Statistical Analysis

Descriptive statistical methods were used to evaluate the data. Continuous variables were expressed as mean±SD, median, minimum-maximum values, while categorical variables were presented as frequencies

and percentages. Statistical analyses were performed using IBM SPSS Statistics version 28.

Results

The demographic characteristics are presented in Table 1. The mean age was 41.5±15.9 years (range: 18–82), and the majority of the patients were male (89.1%). Most patients were classified as ASA physical status I (57.9%). The distribution of surgical indications and anesthesia methods is summarized in Table 2. The most common indication for surgery was ureteral calculi (47.3%), followed by testicular tumor (20.0%), penile fracture (13.6%), testicular torsion (11.8%), and Fournier's gangrene (7.3%).

Spinal anesthesia was the predominant anesthetic technique (79.1%), whereas general anesthesia (19.1%) and sedoanalgesia (1.8%) were used less frequently. The mean duration of surgery was 54.9±18.5 minutes (range: 30–120). No major intraoperative or postoperative complications were observed. None of the patients required postoperative intensive care unit admission, and no mortality was recorded.

Table 1. Demographic and clinical characteristics

Variable	Category	Value
Age, years	Mean ± SD	41.5±15.9
	Median (Min–Max)	39.0 (18–82)
Sex, gender	Male	98 (89.1%)
	Female	12 (10.9%)
ASA physical status	ASA I	64 (58.2%)
	ASA II	30 (27.3%)
	ASA III	16 (14.5%)

Data are presented as mean±standard deviation, median (minimum–maximum), or n (%), as appropriate. ASA: American Society of Anesthesiologists; SD: standard deviation; Min–Max: minimum–maximum.

Discussion

Emergency urological conditions represent a clinically important subset of surgical emergencies that require prompt intervention to prevent irreversible morbidity. Although only a minority of patients presenting to emergency

departments require surgical management, delays in treatment—particularly in conditions such as testicular torsion and Fournier’s gangrene—can lead to organ loss or severe systemic complications. Previous studies analyzing urological emergencies have demonstrated that testicular torsion constitutes a significant proportion of acute presentations and requires urgent surgical intervention to preserve testicular viability (4, 7). Additionally, large-cohort analyses across different regions have shown that the spectrum of urological emergencies may vary geographically, although obstructive uropathy, infections, and acute scrotal pathologies remain the common indications for emergency intervention (8).

Table 2. Anesthetic techniques, duration of surgery, and indications for surgery

Variable	Category	Value
Anesthetic technique	<i>Spinal anesthesia</i>	87 (79.1%)
	<i>General anesthesia</i>	21 (19.1%)
	<i>Sedoanalgesia</i>	2 (1.8%)
Duration of surgery, min	<i>Mean±SD</i>	54.9±18.5
	<i>Median (Min–Max)</i>	60.0 (30–120)
Indication for surgery	<i>Ureteral calculi</i>	52 (47.3%)
	<i>Testicular tumor</i>	22 (20%)
	<i>Penile fracture</i>	15 (13.6%)
	<i>Testicular torsion</i>	13 (11.8%)
	<i>Fournier gangrene</i>	8 (7.3%)

Data are presented as mean ± standard deviation, median (minimum–maximum), or n (%), as appropriate. SD: standard deviation; Min–Max: minimum–maximum.

In the present study, spinal anesthesia was the most commonly preferred anesthetic technique, being used in 79.1% of cases. This finding is consistent with recent literature demonstrating the increasing utilization of regional anesthesia techniques in urological procedures. A recent study by Bulbul et al. reported that spinal anesthesia provides a

shorter duration of anesthesia with comparable complication rates to general anesthesia during ureteroscopy procedures (9). Bürlükara et al. showed that combined spinal-epidural anesthesia improves surgical conditions and increases surgeon satisfaction in percutaneous nephrolithotomy procedures (10).

Regional anesthesia offers several advantages, including avoidance of airway manipulation, reduced risk of aspiration, and improved postoperative analgesia. These benefits are particularly important in emergency settings, where patients may not be adequately fasted. Furthermore, recent evidence suggests that regional anesthesia contributes to enhanced recovery by reducing opioid consumption and facilitating early mobilization (11). In the context of acute scrotal emergencies such as testicular torsion, regional anesthesia techniques have also been reported to be safely applicable, with no increase in perioperative complications (4).

Anesthesia was required in approximately one-fifth of patients, likely due to contraindications to spinal anesthesia or procedure-specific requirements. Despite this, overall outcomes were favorable, with no major complications or ICU admissions observed. This highlights the importance of appropriate selection and multidisciplinary perioperative management. Similar outcome profiles have been reported in previous single-center studies evaluating emergency urological cases (7, 8). Recent studies also emphasize the role of regional anesthesia in emergency and trauma settings. Slama et al. showed that regional anesthesia techniques provide effective analgesia while minimizing systemic side effects in acute care settings (12). Although sedoanalgesia was rarely used in our cohort, systematic reviews indicate that it may be a safe alternative in selected urological procedures (13).

However, this study has several limitations. Its retrospective design limits causal inference, and the single-center setting may restrict

generalizability. Furthermore, the absence of a comparative analysis of anesthesia techniques limits the ability to determine which method is superior.

Conclusion

Spinal anesthesia appears to be a safe and effective option in managing emergency urological surgeries. With appropriate case selection, regional anesthesia techniques can minimize perioperative risks and improve outcomes. Further prospective, multicenter studies are needed to establish standardized anesthesia protocols in this patient population.

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Contact Details

Nurettin KURT, Associate Professor

Anesthesiology and Reanimation

Van Yüzüncü Yıl University

Faculty of Medicine, Van, Türkiye

E-mail: dr.nurettinkurt@gmail.com

ORCID: 0000-0001-7713-5120

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