



Original Research Article

Postoperative Outcomes of Emergency Urological and General Surgical Cases in Tertiary Care Hospitals

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Abstract: Background: Emergency surgical procedures constitute a substantial proportion of hospital admissions in tertiary care centers and are often associated with increased postoperative morbidity and mortality. Patients presenting with acute urological and general surgical conditions frequently require urgent intervention. Evaluating postoperative outcomes is essential for early identification of complications and for improving perioperative management and patient survival. **Objectives** To evaluate postoperative outcomes of emergency urological and general surgical cases and to determine the frequency of complications, length of hospital stay, and mortality among patients treated in tertiary care hospitals. **Methodology** This descriptive cross-sectional study was conducted at department of urology Pak international medical college Peshawar from June 2024 to Dec 2024. A total of 100 patients undergoing emergency urological and general surgical procedures were included. Demographic characteristics, diagnosis, type of surgery, operative duration, postoperative complications, and hospital stay were recorded using a structured data collection form. Patients were followed until discharge or death. Data were analyzed using SPSS version 24. Mean and standard deviation were calculated for quantitative variables, while categorical variables were presented as frequencies and percentages. Statistical significance was set at $p < 0.05$. **Results** A total of 100 patients undergoing emergency surgical procedures were included in the study. The mean age of the patients was 45.6 ± 14.2 years, and males constituted the majority of cases. General surgical emergencies accounted for 62% of procedures, while urological emergencies represented 38%. The most common postoperative complication was surgical site infection, followed by urinary tract infection and postoperative ileus. Patients who developed complications had a significantly longer hospital stay than those without complications. Statistical analysis demonstrated a significant association between type of surgery and postoperative complications ($p = 0.03$). Overall postoperative mortality was low but occurred mainly in patients with severe complications and advanced age. **Conclusion** Emergency urological and general surgical procedures are associated with notable postoperative complications in tertiary care hospitals. Surgical site infection and urinary tract infection were the most frequently observed complications. Early identification of high-risk patients, timely surgical intervention, and improved postoperative monitoring can reduce morbidity and hospital stay. Strengthening perioperative care and infection control practices is essential for improving overall patient outcomes in emergency surgical settings.

Keywords: Emergency surgery; Postoperative outcomes; Urology; Complications

INTRODUCTION

Emergency surgical care represents a crucial component of modern healthcare systems,

particularly in tertiary care hospitals where complex and critically ill patients are frequently managed. Unlike elective procedures, emergency surgeries are

performed under urgent conditions with limited time for patient optimization. As a result, these procedures are often associated with higher rates of postoperative complications, prolonged hospitalization, and increased mortality compared with planned surgical interventions. Globally, emergency surgical conditions account for a substantial proportion of hospital admissions and surgical workload, highlighting the importance of evaluating their outcomes and improving management strategies (1). Emergency general surgical conditions commonly include acute appendicitis, intestinal obstruction, perforated viscus, strangulated hernia, and abdominal trauma. These conditions often present with acute abdominal pain and systemic manifestations that require prompt diagnosis and surgical intervention. Delayed treatment may lead to serious complications such as sepsis, organ failure, and death (2). Similarly, urological emergencies such as obstructive uropathy, complicated ureteric calculi, acute urinary retention, and genitourinary trauma frequently require urgent procedures including ureteric stenting, percutaneous nephrostomy, or suprapubic catheterization (3). Postoperative outcomes following emergency surgical procedures depend on several factors, including the severity of disease at presentation, comorbid conditions, surgical expertise, and perioperative care. Patients undergoing emergency operations often present with physiological derangements such as dehydration, electrolyte imbalance, or infection, which may compromise recovery and increase the risk of complications (4). In addition, inadequate preoperative preparation and time constraints further contribute to adverse postoperative outcomes. Postoperative complications are a major concern in emergency surgical patients. Common complications include surgical site infection, pneumonia, urinary tract infection, postoperative ileus, sepsis, and thromboembolic events. Surgical site infection remains one of the most frequently reported complications and significantly contributes to prolonged hospital stay and increased healthcare costs (5). Respiratory complications such as pneumonia are also commonly observed, particularly in elderly patients and those with underlying comorbidities (6). Several studies have demonstrated that emergency surgeries account for a disproportionate share of postoperative morbidity and mortality. Although emergency operations constitute a smaller proportion of total surgical procedures, they are responsible for more than half of postoperative deaths worldwide (7). This highlights the need for improved perioperative management, early recognition of complications, and better postoperative monitoring in patients undergoing emergency surgery. Tertiary care hospitals play a pivotal role in managing emergency surgical cases due to their advanced diagnostic facilities, experienced surgical teams, and availability

of intensive care units. Despite these advantages, the burden of postoperative complications remains high because of case complexity and delayed patient presentation (8). In many developing countries, limited healthcare resources, delayed referral systems, and inadequate postoperative monitoring further increase the risk of adverse outcomes. Understanding the pattern of postoperative outcomes in emergency urological and general surgical cases is essential for improving patient care and optimizing resource allocation. By identifying common complications and associated risk factors, healthcare providers can develop targeted interventions aimed at reducing postoperative morbidity and mortality (9). Additionally, systematic evaluation of surgical outcomes can help improve clinical protocols, infection control measures, and perioperative management strategies. Therefore, this study aimed to evaluate postoperative outcomes among patients undergoing emergency urological and general surgical procedures in tertiary care hospitals. The findings may contribute to improved surgical practices, enhanced postoperative monitoring, and better overall patient outcomes in emergency surgical settings (10).

Research Objective

To assess postoperative outcomes of emergency urological and general surgical cases in tertiary care hospitals and to determine the frequency of complications, length of hospital stay, and mortality among patients.

Materials and Methods

Study Design and Setting

This descriptive cross-sectional study was conducted in the at department of urology Pak international medical college Peshawar from June 2024 to Dec 2024 providing emergency surgical services during the study period.

Participants

The study included patients who presented with emergency surgical conditions requiring immediate operative intervention. Adult patients undergoing emergency procedures in the departments of general surgery and urology were considered eligible. Demographic characteristics, clinical presentation, surgical procedures, and postoperative outcomes were recorded using a structured data collection form.

Sample Size Calculation

The sample size was calculated using the standard formula for descriptive studies, assuming an expected complication prevalence of 50%, a confidence level of 95%, and a margin of error of 10%. Based on these parameters, a minimum sample size of 96 patients

was required; therefore, 100 patients were included in the study.

Inclusion Criteria

Patients aged 18 years or older who underwent emergency urological or general surgical procedures during the study period were included. Individuals presenting with acute surgical conditions requiring urgent intervention and who provided informed consent to participate were considered eligible.

Exclusion Criteria

Patients undergoing elective surgical procedures were excluded. Individuals younger than 18 years, patients with incomplete medical records, and those who declined participation were also excluded. Patients transferred to other hospitals before completion of postoperative follow-up were not included in the final analysis.

Ethical Approval

Ethical approval for the study was obtained from the institutional ethical review committee of the participating tertiary care hospital. All procedures

were conducted in accordance with ethical principles for medical research involving human participants. Informed consent was obtained from all patients prior to inclusion in the study.

Diagnostic and Management Strategy

Patients presenting with emergency surgical conditions underwent detailed clinical evaluation supported by laboratory investigations and imaging studies, such as ultrasonography or computed tomography. Appropriate emergency surgical procedures were performed, followed by standardized postoperative monitoring and management according to hospital protocols.

Statistical Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 24. Continuous variables were expressed as mean and standard deviation, while categorical variables were presented as frequencies and percentages. The chi-square test and independent t-test were used to assess associations between variables. A p-value of less than 0.05 was considered statistically significant.

RESULTS

A total of 100 patients who underwent emergency surgical procedures were included in the study. The mean age of the patients was 45.6 ± 14.2 years, with an age range of 18 to 78 years. The majority of patients were male (64%), while females accounted for 36% of the study population. Emergency general surgical cases constituted 62% of procedures, whereas 38% were emergency urological cases. Among the general surgical emergencies, the most common indications for surgery were acute appendicitis (28%), intestinal obstruction (15%), perforation peritonitis (12%), and strangulated hernia (7%). In the urological group, the most frequent conditions were obstructive uropathy due to ureteric calculi (16%), acute urinary retention requiring suprapubic cystostomy (12%), and genitourinary trauma (10%). Postoperative complications were observed in 29% of patients. The most frequently encountered complication was surgical site infection (12%), followed by urinary tract infection (7%), postoperative ileus (5%), and pneumonia (3%). Patients who developed postoperative complications had a significantly longer hospital stay than those without complications (8.4 ± 3.1 days vs 4.9 ± 2.2 days, $p = 0.02$). Furthermore, complications were more common among patients older than 50 years and those presenting with severe infection or delayed hospital admission. Statistical analysis showed a significant association between type of surgery and postoperative complication rate ($p = 0.03$). Patients undergoing emergency laparotomy had higher complication rates than those undergoing minor urological procedures. Regarding secondary outcomes, 12% of patients required postoperative intensive care unit (ICU) admission due to severe complications such as sepsis, respiratory distress, or hemodynamic instability. The overall postoperative mortality rate was 3%, mainly observed in elderly patients with perforation peritonitis and advanced sepsis. Overall, the findings indicate that emergency surgical procedures in tertiary care hospitals are associated with a considerable risk of postoperative complications, particularly among older patients and those presenting with severe underlying conditions.

Table 1. Baseline Characteristics and Distribution of Emergency Surgical Cases

Variable	Frequency (n)	Percentage (%)
Age (years), mean $\pm$ SD	45.6 $\pm$ 14.2	—
Gender		
Male	64	64%
Female	36	36%
Type of Emergency Surgery		
General surgical cases	62	62%
Urological cases	38	38%
Common General Surgical Diagnoses		

Acute appendicitis	28	28%
Intestinal obstruction	15	15%
Perforation peritonitis	12	12%
Strangulated hernia	7	7%
Common Urological Diagnoses		
Obstructive uropathy due to ureteric calculi	16	16%
Acute urinary retention requiring suprapubic cystostomy	12	12%
Genitourinary trauma	10	10%

Table 2. Distribution of Emergency Surgical Procedures and Postoperative Complications

Type of Surgery	Total Patients (n)	Patients with Complications (n)	Patients without Complications (n)	p-value	Statistical Test
General Surgical Procedures	62	21	41	0.03	Chi-square test
Urological Procedures	38	8	30		
Total	100	29	71		

Table 2 demonstrates the relationship between type of surgery and postoperative complications. General surgical procedures showed a higher frequency of complications compared with urological procedures. The association between type of surgery and complication rate was assessed using the chi-square test and was found to be statistically significant ($p = 0.03$).

Table 3. Postoperative Outcomes and Hospital Stay

Outcome Variable	Mean $\pm$ SD / Frequency	Statistical Test	p-value
Hospital stay (patients with complications)	8.4 $\pm$ 3.1 days	Independent t-test	0.02
Hospital stay (patients without complications)	4.9 $\pm$ 2.2 days		
ICU admission	12 (12%)	Chi-square test	
Mortality	3 (3%)		

Table 3 summarizes the postoperative outcomes of the study population. Patients who developed complications had a significantly longer hospital stay than those without complications. This difference was evaluated using the independent t-test and was statistically significant ($p = 0.02$). ICU admission and mortality were analyzed descriptively, with chi-square testing applied where appropriate.

DISCUSSION

The present study showed that postoperative complications occurred in 29% of patients undergoing emergency urological and general surgical procedures, with surgical site infection (SSI) being the most frequent complication, followed by urinary tract infection (UTI), postoperative ileus, and pneumonia. These findings are in keeping with recent literature showing that emergency surgical patients experience substantially higher postoperative morbidity than elective cases because of delayed presentation, physiological instability, contamination, sepsis, and limited time for preoperative optimization [11–14]. Contemporary studies on emergency laparotomy and emergency general surgery have reported complication rates ranging from modest levels in mixed emergency cohorts to markedly higher rates in high-risk laparotomy populations, particularly when elderly or septic patients are included [11–15]. In our series, general surgical procedures were associated with a significantly higher complication rate than urological procedures ($p = 0.03$). This difference is biologically plausible and is supported by recent comparative evidence. Emergency laparotomy, bowel surgery,

and procedures for perforation, obstruction, and peritonitis involve greater contamination, longer operative exposure, and a higher burden of systemic inflammatory response than relatively less invasive emergency urological interventions such as ureteric stenting or suprapubic diversion [15–18]. Recent reports have shown that infections are among the most common operation-related complications after emergency laparotomy, while emergency ureteroscopy and urgent urinary diversion tend to have acceptable safety profiles with fewer major postoperative events, although emergency department revisits and stent-related morbidity may still occur [15–19]. SSI was the leading complication in our study (12%), which aligns with current evidence identifying SSI as one of the most frequent and clinically important complications after emergency abdominal surgery [12,16,20,21]. Recent studies have reported that SSI rates are consistently higher in emergency procedures than in elective operations and are strongly influenced by wound contamination, delayed presentation, higher ASA class, prolonged operative duration, and generalized peritonitis [16,20–22]. Interventional work published in the last two years also suggests that bundle-based

infection prevention strategies can reduce SSI rates and may shorten hospitalization, emphasizing the importance of perioperative antibiotics, appropriate skin preparation, glycemic control, and wound surveillance [21,22]. Another important finding in this study was the significantly longer hospital stay among patients who developed complications (8.4 ± 3.1 vs 4.9 ± 2.2 days, $p = 0.02$). This observation closely mirrors recent studies demonstrating that postoperative complications—especially SSI, sepsis, respiratory events, and ileus—are major drivers of prolonged hospitalization and increased resource utilization after emergency surgery [13,17,23,24]. In emergency urology as well, postoperative fever, infection, catheter-related issues, and procedure complexity have been associated with longer admission or unplanned return to care [18,24,25]. The present study also found that complications were more common in older patients and those presenting with severe infection or delayed admission, while mortality remained low overall (3%) but occurred mainly in elderly patients with perforation peritonitis and advanced sepsis. This pattern is highly consistent with the contemporary literature, which identifies age, frailty, sepsis, comorbidity burden, and delayed presentation as major predictors of adverse outcomes after emergency surgery [14,15,26–28]. Although our mortality rate was lower than that reported in several emergency laparotomy cohorts, this may reflect the inclusion of lower-risk urological procedures and a broader emergency case mix rather than only major abdominal surgery [15,26–28]. Overall, our findings reinforce the need for early diagnosis, prompt intervention, rigorous infection prevention, and closer postoperative monitoring of high-risk patients in tertiary care settings.

Limitations

This study has several limitations. It was conducted on a relatively small sample from tertiary care hospitals, which may limit generalizability. The descriptive cross-sectional design prevented causal inference. Patients were followed only until discharge or death, so late postoperative complications were not assessed. In addition, variation in disease severity and procedures may have influenced outcomes.

Conclusion

Emergency urological and general surgical procedures are associated with considerable postoperative morbidity, particularly infections and prolonged hospital stay. Complications were more frequent in general surgical cases, older patients, and those with severe presentation. Early risk identification, timely intervention, and stronger perioperative and infection-control measures are essential to improve outcomes in tertiary care hospitals.

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