

LONG-TERM MORTALITY AND MORBIDITY IN PATIENTS UNDERGOING EMERGENCY VS. ELECTIVE ABDOMINAL SURGERY: AN OBSERVATIONAL STUDY

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Abstract

Background: Emergency abdominal surgeries are often associated with higher rates of complications and mortality compared to elective surgeries. Understanding the differences in long-term outcomes between these two patient groups can guide improvements in care and patient counseling. To compare the long-term mortality and morbidity outcomes of patients undergoing emergency versus elective abdominal surgery. **Materials and Methods:** This retrospective observational study included 100 patients divided equally into two groups: those undergoing emergency abdominal surgery and those undergoing elective surgery. Data were collected on demographics, preoperative health status, surgical details, postoperative outcomes, and long-term outcomes including mortality, morbidity, readmissions, and quality of life. Statistical analysis involved chi-square and t-tests for categorical and continuous variables, respectively, and Cox proportional hazards models to adjust for confounders. **Result:** The emergency surgery group exhibited significantly higher long-term mortality (18% vs. 6%, $p < 0.05$) and morbidity, including chronic pain (30% vs. 15%, $p < 0.01$), hernia formation (25% vs. 10%, $p < 0.01$), and bowel obstruction (20% vs. 5%, $p < 0.01$). Hospital readmission rates were also higher in the emergency group (40% vs. 20%, $p < 0.01$). Quality of life scores were significantly lower in the emergency surgery group (6 ± 2 vs. 8 ± 1 , $p < 0.01$). After adjusting for age, BMI, and comorbidities, the emergency surgery group still showed a significantly higher risk of mortality (HR = 2.5, 95% CI 1.3-4.8) and major complications (odds ratio = 2.2, 95% CI 1.1-4.5). **Conclusion:** Patients undergoing emergency abdominal surgery face significantly worse long-term outcomes compared to those undergoing elective surgery. These findings underscore the need for targeted strategies to improve care and outcomes for patients requiring emergency surgery.

INTRODUCTION

Abdominal surgery, encompassing a wide range of procedures performed on organs within the abdominal cavity, is a common intervention in clinical practice.^[1,2] These surgeries can be categorized into two main types based on the urgency of the procedure: emergency and elective. Emergency abdominal surgeries are performed in response to acute conditions that pose immediate risks to patients, such as appendicitis, perforated ulcers, or intestinal obstruction.^[3] In contrast, elective

surgeries are planned procedures for conditions that are not immediately life-threatening, such as benign tumors or hernia repair.^[4]

The distinction between emergency and elective abdominal surgeries is critical, as the urgency and underlying pathology significantly influence surgical outcomes.^[5] Emergency procedures often present in a context of heightened risk, including unstable patient conditions, the need for rapid intervention, and the presence of sepsis or hemodynamic instability.^[6] These factors contribute to a higher incidence of postoperative complications and

mortality compared to elective surgeries, which are performed under more controlled circumstances.^[7] Despite advancements in surgical techniques and postoperative care, significant disparities in outcomes between emergency and elective abdominal surgeries persist. Long-term outcomes, in particular, are a growing area of concern and research. While short-term surgical outcomes have been extensively studied, less is known about the long-term effects on mortality, morbidity, readmission rates, and quality of life following these procedures.^[8,9] This gap in knowledge is especially pronounced for emergency surgeries, where the immediate focus on saving lives may overshadow the need to understand and mitigate long-term adverse outcomes.

This study aims to fill this gap by comparing the long-term mortality and morbidity outcomes of patients undergoing emergency versus elective abdominal surgery. By identifying specific areas where emergency surgery patients face greater risks, healthcare providers can develop targeted strategies to improve preoperative preparation, surgical intervention, and postoperative care, ultimately enhancing patient outcomes and quality of life. Through this research, we seek not only to quantify the differences in long-term outcomes but also to understand their underlying causes and to inform clinical practice and policy to mitigate these disparities.

MATERIALS AND METHODS

Study Design: This is a retrospective observational study designed to compare the long-term outcomes of patients undergoing emergency versus elective abdominal surgery.

Study Period and Setting: The study was conducted over a two-year period, from February 2022 to January 2024, at the Government Medical College, Mahasamund, Chhattisgarh, India.

Participants: The study included a total of 100 patients who underwent abdominal surgery during the study period. Patients were divided into two groups based on the type of surgery: emergency surgery (n=50) and elective surgery (n=50).

Inclusion Criteria

Adults aged 18 years and older.

Patients who underwent abdominal surgery, including procedures such as appendectomy, cholecystectomy, hernia repair, and bowel resection.

Exclusion Criteria

Patients with incomplete medical records.

Patients who were lost to follow-up.

Data Collection: Data were retrospectively collected from patient medical records, surgical reports, and follow-up visits. The following information was extracted for each patient:

Demographic Information: Age, gender, body mass index (BMI).

Preoperative Health Status: Presence of comorbid conditions such as hypertension and diabetes, American Society of Anesthesiologists (ASA) physical status classification.

Surgical Details: Type of surgery, duration of surgery, intraoperative complications.

Postoperative Outcomes: Length of hospital stay, immediate postoperative complications (e.g., wound infection, pulmonary complications).

Long-term Outcomes: Mortality, morbidity (e.g., chronic pain, hernia, bowel obstruction), hospital readmissions, and quality of life assessments. Long-term outcomes were followed up for a period extending up to two years post-surgery.

Quality of Life Assessment: Quality of life was assessed using a validated questionnaire, with scores ranging from 0 to 10, where higher scores indicate better quality of life.

Statistical Analysis: Data were analyzed using statistical software. Descriptive statistics (mean \pm standard deviation for continuous variables and percentages for categorical variables) were used to summarize patient characteristics and outcomes. The chi-square test or Fisher's exact test was used for categorical variables, and the Student's t-test or Mann-Whitney U test was used for continuous variables, to compare the emergency and elective surgery groups. Kaplan-Meier survival analysis was employed to estimate long-term mortality, and Cox proportional hazards models were used to adjust for potential confounders. A p-value of less than 0.05 was considered statistically significant.

Ethical Considerations: The study protocol was reviewed and approved by the Institutional Ethics Committee of the Government Medical College, Mahasamund. Given the retrospective nature of the study, patient consent was waived. However, all patient information was anonymized and handled in accordance with ethical standards and confidentiality requirements.

RESULTS

This observational study sought to compare the long-term mortality and morbidity outcomes of 100 patients undergoing either emergency or elective abdominal surgery. The participants were divided equally into two groups: emergency surgery (n=50) and elective surgery (n=50). Below, we present the demographic characteristics, surgical details, postoperative outcomes, and long-term outcomes of the two groups.

Demographics and Preoperative Health Status

The mean age of patients undergoing emergency surgery was 62 years (SD \pm 15), compared to 59 years (SD \pm 12) in the elective surgery group. Males constituted 54% of the emergency group and 48% of the elective group. The average body mass index (BMI) was slightly higher in the emergency group (28 kg/m², SD \pm 5) than in the elective group (27 kg/m², SD \pm 4). Preoperative comorbidities such as

hypertension and diabetes were more prevalent in the emergency surgery group (70% and 40%, respectively) than in the elective surgery group (60% and 30%, respectively).

Surgical Details: The duration of surgery was longer for emergency procedures, averaging 185 minutes (SD ± 45), compared to 150 minutes (SD ± 35) for elective surgeries. Additionally, intraoperative complications were more common in the emergency surgery group, with a rate of 22%, compared to 8% in the elective surgery group.

Postoperative Outcomes:

Patients undergoing emergency surgery had a longer average hospital stay (12 days, SD ± 6) compared to those undergoing elective surgery (8 days, SD ± 3). The incidence of postoperative wound infections (20% vs. 10%) and pulmonary complications (15% vs. 5%) was also higher in the emergency surgery group.

Long-term Outcomes: The long-term follow-up (1-4 years post-surgery) revealed significant differences in outcomes between the two groups. Mortality was higher in the emergency surgery group (18%) compared to the elective surgery group (6%).

Similarly, the rates of chronic pain (30% vs. 15%), hernia formation (25% vs. 10%), bowel obstruction (20% vs. 5%), and hospital readmissions due to related complications (40% vs. 20%) were all higher in the emergency surgery group. Quality of life, measured on a scale of 0-10, was lower in the emergency surgery group (6 ± 2) than in the elective surgery group (8 ± 1).

Statistical Analysis: Comparative analyses showed statistically significant differences between the emergency and elective surgery groups in terms of mortality (p < 0.05), chronic pain (p < 0.01), hernia development (p < 0.01), and readmission rates (p < 0.01), indicating poorer long-term outcomes for the emergency surgery group. Quality of life scores were also significantly lower in the emergency group (p < 0.01). After adjusting for confounders such as age, BMI, and preoperative comorbidities using a Cox proportional hazards model, the emergency surgery group still exhibited a significantly higher risk of mortality (HR = 2.5, 95% CI 1.3-4.8) and major postoperative complications (odds ratio = 2.2, 95% CI 1.1-4.5).

Table 1: Demographics and Preoperative Health Status

Parameter	Emergency	Elective
Age (years)	62 ± 15	59 ± 12
Gender (% Male)	54%	48%
BMI (kg/m ²)	28 ± 5	27 ± 4
Hypertension (%)	70%	60%
Diabetes (%)	40%	30%

Table 2: Surgical Details

Parameter	Emergency	Elective
Duration of Surgery (minutes)	185 ± 45	150 ± 35
Intraoperative Complications (%)	22%	8%

Table 3: Postoperative Outcomes

Parameter	Emergency	Elective
Length of Hospital Stay (days)	12 ± 6	8 ± 3
Wound Infection (%)	20%	10%
Pulmonary Complications (%)	15%	5%

Table 4: Long-term Outcomes

Parameter	Emergency	Elective
Mortality (%)	18%	6%
Chronic Pain (%)	30%	15%
Hernia (%)	25%	10%
Bowel Obstruction (%)	20%	5%
Readmissions (%)	40%	20%
Quality of Life (0-10)	6 ± 2	8 ± 1

DISCUSSION

The findings of our observational study underscore the significant disparities in long-term outcomes between patients undergoing emergency and elective abdominal surgery at the Government Medical College, Mahasamund, Chhattisgarh. Consistent with existing literature, our study revealed higher rates of long-term mortality, morbidity, readmissions, and lower quality of life scores in patients who underwent emergency surgery compared to their elective

counterparts. These results highlight the complex interplay of factors contributing to the poorer outcomes observed in emergency surgical patients, including the acute nature of their conditions, the presence of comorbidities, and the challenges inherent in performing surgery under emergency conditions.

Mortality and Morbidity: The increased long-term mortality rate observed in the emergency surgery group aligns with previous research indicating that the urgent nature of these surgeries, often performed

in the context of sepsis or hemodynamic instability, significantly elevates the risk of postoperative complications and death. The higher incidence of chronic pain, hernia development, and bowel obstructions in this group further reflects the complexity and severity of conditions necessitating emergency surgery, as well as potential factors related to the surgery itself, such as the extent of the intervention and the presence of infection at the time of surgery.^[10,11]

Readmissions: The doubled rate of hospital readmissions in the emergency surgery group may be indicative of the greater severity of illness in these patients, as well as the potential for postoperative complications that require additional medical attention. This finding suggests a need for enhanced postoperative follow-up and support for patients undergoing emergency abdominal surgery, possibly through targeted interventions aimed at identifying and managing complications early.^[12,13]

Quality of Life: Quality of life (QoL) assessments revealed significantly lower scores among patients who had undergone emergency surgery, pointing to the lasting impact of emergency abdominal conditions and their treatment on patients' well-being. The difference in QoL scores between the two groups underscores the importance of incorporating patient-centered outcomes in the evaluation of surgical care, particularly for those undergoing emergency procedures.^[14]

Clinical Implications: Our study's findings suggest several potential avenues for improving care for patients requiring emergency abdominal surgery. Enhancing preoperative care, optimizing surgical timing, and implementing evidence-based postoperative care pathways may help mitigate the risks associated with emergency surgeries. Additionally, the development of multidisciplinary care models, incorporating pain management, nutritional support, and rehabilitation services, could play a critical role in improving long-term outcomes for these patients.

Limitations

While our study provides valuable insights into the long-term outcomes of emergency versus elective abdominal surgery, it is not without limitations. The retrospective design and the relatively small sample size may limit the generalizability of our findings. Additionally, the study's reliance on medical records for data collection may have introduced information bias. Future research, ideally in the form of prospective studies with larger sample sizes, is needed to validate our findings and explore the mechanisms underlying the observed disparities in outcomes.

CONCLUSION

The significant differences in long-term outcomes observed between emergency and elective abdominal surgery patients highlight the need for targeted

strategies to improve surgical care and postoperative support for the former group. By addressing the unique challenges faced by patients undergoing emergency abdominal surgery, healthcare providers can help reduce the burden of postoperative complications, improve quality of life, and ultimately enhance patient outcomes.

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