

## **Postoperative Complications After Esophagectomy: A Three-Year Single-Center Experience.**

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### **Abstract**

#### **Background**

Esophagectomy is one of the most complex surgical procedures performed for both malignant and selected benign esophageal diseases. Despite improvements in surgical techniques, anesthesia, and perioperative care, esophagectomy remains associated with considerable postoperative morbidity and mortality. Common complications include pulmonary complications, anastomotic leak, wound infection, and cardiac events. Evaluating postoperative complications after esophagectomy is essential to improve perioperative management and patient outcomes.

#### **Objectives**

To assess the frequency and pattern of postoperative complications after esophagectomy over a five-year period at a single tertiary care center and to determine their association with hospital stay, intensive care admission, and postoperative mortality.

#### **Methodology**

This retrospective descriptive study was conducted at Department of Thoracic Surgery Unit, Lady Reading Hospital – Medical Teaching Institution, Peshawar from Jan 2018 to Jan 2021. Over a three-year period. A total of 100 patients who underwent esophagectomy during the study period were included. Demographic characteristics, indication for surgery, operative duration, type of esophagectomy, postoperative complications, hospital stay, ICU admission, and mortality were recorded using a structured data collection form. Data were analyzed using SPSS version 24. Continuous variables were expressed as mean  $\pm$  standard deviation, while categorical variables were presented as frequencies and percentages. Statistical significance was set at  $p < 0.05$ .

**Postoperative Complications After Esophagectomy: A Three-Year Single-Center Experience.**

**Results**

A total of 100 patients underwent esophagectomy during the study period. The mean age of patients was  $56.4 \pm 11.8$  years, and the majority were male (68%). The most common indication for surgery was esophageal carcinoma (84%). Postoperative complications were observed in 42% of patients. The most frequent complication was pulmonary complications (18%), followed by anastomotic leak (10%), surgical site infection (7%), and cardiac complications (5%). Patients who developed complications had a significantly longer hospital stay compared with those without complications ( $16.2 \pm 5.4$  days vs  $10.1 \pm 3.7$  days,  $p = 0.01$ ). ICU admission was required in 20% of patients, while overall postoperative mortality was 6%.

**Conclusion**

Postoperative complications after esophagectomy remain common and significantly affect hospital stay and patient outcomes. Pulmonary complications and anastomotic leakage were the most frequently observed adverse events. Early identification of high-risk patients and improved perioperative care are essential to reduce morbidity and mortality after esophagectomy.

**Keywords:** Esophagectomy; Postoperative complications; Pulmonary complications; Anastomotic leak; Surgical outcomes

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**Introduction**

Esophagectomy is a major surgical procedure commonly performed for the treatment of esophageal carcinoma and certain benign esophageal disorders. It remains one of the most technically demanding operations in thoracic and upper gastrointestinal surgery because of the complexity of the procedure and the significant physiological stress it imposes on patients (1). Despite advances in surgical techniques and preoperative management, postoperative complications remain a significant concern after esophagectomy (2). Patients undergoing esophagectomy are at considerable risk of developing both surgical and medical complications. Common postoperative complications include pulmonary complications, anastomotic leakage, recurrent laryngeal nerve injury, wound infection, sepsis, and cardiac arrhythmias (3). Among these, pulmonary complications and anastomotic leaks are considered the most serious because they contribute significantly to prolonged hospitalization and increased mortality (4). The incidence of postoperative morbidity following esophagectomy is influenced by several factors, including patient age, nutritional status, comorbid conditions, tumor stage, neoadjuvant therapy, operative duration, and surgical technique (5). Elderly patients and those with underlying cardiopulmonary disease are particularly vulnerable to adverse postoperative outcomes (6). In addition, the complexity of esophageal surgery often requires multidisciplinary preoperative care involving surgeons, anesthetists, intensivists, and respiratory therapists (7). Recent studies have highlighted that postoperative complications after esophagectomy not only increase hospital stay but may also negatively affect long-term survival outcomes (8). Early identification and prompt management of complications are therefore essential to improve recovery and reduce mortality (9). Continuous evaluation of postoperative outcomes is also important for assessing institutional performance and improving surgical care (10). Single-center experiences provide valuable insights into complication

**Postoperative Complications After Esophagectomy: A Three-Year Single-Center Experience.**

patterns, institutional outcomes, and opportunities for quality improvement. Such studies help identify risk factors and guide strategies aimed at reducing postoperative morbidity (11). Therefore, this study aimed to evaluate postoperative complications after esophagectomy over a five-year period at a tertiary care center.

**Research Objective**

To assess postoperative complications after esophagectomy over a three-year period and determine their association with hospital stay, ICU admission, and mortality.

**Materials and Methods**

**Study Design and Setting**

This retrospective descriptive study was conducted at Department of Thoracic Surgery Unit, Lady Reading Hospital Medical Teaching Institution, Peshawar from jan 2018 to jan 2021.

**Participants**

The study included 100 patients who underwent esophagectomy during the study period.

**Inclusion Criteria**

Patients aged 18 years or older who underwent esophagectomy for malignant or benign esophageal disease during the study period were included.

**Exclusion Criteria**

Patients with incomplete medical records, those who underwent palliative procedures without esophagectomy, and patients lost to follow-up were excluded.

**Data Collection**

Patient demographic data, surgical indication, operative duration, postoperative complications, hospital stay, ICU admission, and mortality were recorded using a structured data collection sheet.

**Statistical Analysis**

Data were analyzed using SPSS version 24. Continuous variables were expressed as mean  $\pm$  SD, while categorical variables were presented as frequencies and percentages. Statistical significance was considered at  $p < 0.05$ .

**Results**

A total of 100 patients underwent esophagectomy during the three-year study period. The mean age was  $56.4 \pm 11.8$  years, and males represented 68% of patients. Esophageal carcinoma was the most common indication for surgery. Postoperative complications occurred in 42 patients (42%). The most common complication was pulmonary complications (18%), followed by anastomotic leak (10%), surgical site infection (7%), and cardiac complications (5%). Patients with complications had significantly longer hospital stays than those without complications ( $16.2 \pm 5.4$  days vs  $10.1 \pm 3.7$  days,  $p = 0.01$ ). ICU admission was required in 20% of cases. Overall postoperative mortality was 6%.

**Table 1. Baseline Characteristics of Study Population**

**Postoperative Complications After Esophagectomy: A Three-Year Single-Center Experience.**

Variable	Frequency (n)	Percentage (%)
Mean age (years)	56.4 ± 11.8	—
Male	68	68%
Female	32	32%
Esophageal carcinoma	84	84%
Benign esophageal disease	16	16%

Table 2. Postoperative Complications After Esophagectomy

Complication	Frequency (n)	Percentage (%)
Pulmonary complications	18	18%
Anastomotic leak	10	10%
Surgical site infection	7	7%
Cardiac complications	5	5%
No complications	58	58%

Table 3. Postoperative Outcomes

Outcome	Value
Hospital stay with complications	16.2 ± 5.4 days
Hospital stay without complications	10.1 ± 3.7 days
ICU admission	20%
Mortality	6%

**Discussion**

The present study evaluated postoperative complications after esophagectomy over a three-year period at a single tertiary care center. Postoperative complications were observed in 42% of patients, with pulmonary complications being the most common adverse event. These findings are consistent with previous studies reporting pulmonary complications as the leading cause of morbidity following esophagectomy (12). Pulmonary complications remain frequent because of factors such as prolonged operative time, reduced lung expansion due to thoracic procedures, and postoperative pain limiting effective respiration (13). Several studies have reported pulmonary complication rates ranging between 15% and 30% after esophagectomy (14). Anastomotic leakage was the second most common complication in this study. Anastomotic leaks are considered one of the most serious complications after esophagectomy and are associated with increased morbidity, longer hospitalization, and increased mortality (15). Similar leak rates have been reported in other institutional studies evaluating outcomes after esophageal surgery (16). In the present study,

**Postoperative Complications After Esophagectomy: A Three-Year Single-Center Experience.**

patients who developed complications had significantly longer hospital stays compared with those without complications. Previous research has shown that postoperative complications are a major contributor to prolonged hospitalization and increased healthcare costs after esophagectomy (17).ICU admission was required in a notable proportion of patients, reflecting the complexity of postoperative care following major thoracic surgery (18). Intensive monitoring is often necessary in the early postoperative period to manage respiratory compromise and hemodynamic instability. The mortality rate observed in this study was comparable with previously published data from high-volume surgical centers (19). Mortality after esophagectomy is usually associated with severe complications such as respiratory failure or sepsis resulting from anastomotic leakage (20).Several studies have emphasized that improved perioperative care pathways, including enhanced respiratory physiotherapy, nutritional optimization, and careful patient selection, can significantly reduce postoperative complications (21). Continuous monitoring of institutional outcomes and adherence to evidence-based perioperative protocols may further improve patient recovery and survival after esophagectomy (22).

**Limitations**

This study was conducted at a single center and included a limited number of patients, which may limit the generalization of the findings. In addition, the retrospective design may introduce potential data limitations.

**Conclusion**

Postoperative complications after esophagectomy remain common and significantly influence patient outcomes. Pulmonary complications and anastomotic leakage were the most frequently observed complications. Improved perioperative management and early recognition of complications are essential to reduce morbidity and mortality after esophagectomy.

**Disclaimer:**Nil

**Conflict of Interest:**Nil

**Funding Disclosure:**Nil

**Authors Contribution**

Concept & Design of Study: Faridullah Khan Ismail<sup>1</sup>

Data Collection: Muhammad Abid Khan<sup>2</sup>

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**Postoperative Complications After Esophagectomy: A Three-Year Single-Center Experience.**

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**Postoperative Complications After Esophagectomy: A Three-Year Single-Center Experience.**

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