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ORIGINAL ARTICLE

Postoperative Morbidity and Mortality after Ivor Lewis Esophagectomy with and without Feeding Jejunostomy: A Retrospective Analysis

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Abstract

Background: *Esophagectomy, particularly the Ivor Lewis procedure, remains a key surgical approach for esophageal carcinoma but is associated with significant postoperative risks. Feeding jejunostomy (FJ) is frequently used to ensure nutritional support; however, its routine placement is debated due to potential complications and unclear benefits.*

Methods: *A retrospective comparative cross-sectional study was conducted at a tertiary care center in Dhaka, Bangladesh, from January 2022 to June 2023. Seventy patients with histologically confirmed esophageal cancer undergoing Ivor Lewis esophagectomy were included. Patients were divided into two groups: Group A (n=30) without FJ and Group B (n=40) with FJ. Demographic, clinical, operative, and postoperative data were analyzed using SPSS v25, with a p-value d" 0.05 considered statistically significant.*

Results: *Baseline characteristics between the two groups were comparable. The operative time was significantly longer in Group B (336.25±40.11 minutes) compared to Group A (296.00±28.11 minutes; p=0.05). There were no significant differences in ICU stay, discharge weight, readmission rate, or mortality. Skin complications were noted exclusively in Group B (13.33%; p=0.04). No significant differences were observed in anastomotic leakage or mortality.*

Conclusions: *Routine placement of feeding jejunostomy during Ivor Lewis esophagectomy does not appear to significantly enhance postoperative outcomes and may lead to an increased risk of local complications, such as skin infections. Therefore, selective use of FJ based on the patient's nutritional status, comorbidities, and perioperative risk factors may be a more appropriate approach. Further prospective studies are warranted to validate these findings and guide clinical practice.*

Keywords: *Esophageal cancer, Ivor Lewis esophagectomy, feeding jejunostomy, postoperative morbidity, mortality, nutritional support.*

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Introduction

Esophageal cancer represents a major global health concern, ranking as the seventh most common malignancy and the sixth leading cause of cancer-related death worldwide [I]. According to GLOBOCAN 2020, approximately 604,100 new cases and 544,076 deaths were reported globally, reflecting a rising burden, especially in low- and middle-income countries [II]. The increasing incidence of esophageal cancer has been linked to multiple risk factors, including tobacco use, alcohol consumption, dietary deficiencies (such as low intake of fruits and vegetables), poor oral hygiene, and exposure to carcinogenic substances [III]. In Bangladesh, the impact is particularly significant, with esophageal cancer ranking as the third most common cancer among males and fifth among females. More than 6,000 new cases are diagnosed each year, and the burden continues to grow due to delays in diagnosis and limited access to specialized care [IV]. Despite advances in multimodal treatment including neoadjuvant chemoradiotherapy and targeted therapy, surgical resection remains the primary curative option for patients with resectable disease [V]. Among the available surgical techniques, the Ivor-Lewis esophagectomy is frequently utilized for tumors located in the middle thirds of the esophagus [VI]. This procedure combines a laparotomy and right thoracotomy to allow for subtotal esophagectomy and the creation of an intrathoracic esophagogastric anastomosis [VII]. It provides excellent oncologic outcomes and permits systematic lymphadenectomy. However, the extensive nature of the surgery and postoperative physiological stress contribute to a high incidence of complications [VIII]. Adequate nutritional support during the perioperative period is therefore essential to reduce postoperative morbidity, accelerate recovery, support immune function, and improve patient outcomes [IX]. Feeding jejunostomy is a commonly performed adjunct procedure during esophagectomy, facilitating early postoperative enteral nutrition [X]. Although this technique offers a reliable route for nutrient delivery, it is not without drawbacks. The procedure involves puncturing and fixing the jejunum to the abdominal wall, which can result in intestinal adhesions, bowel obstruction, leakage, and surgical site infections [XI]. Furthermore, local skin complications such as corrosion, ulceration, and necrosis due to backflow of digestive secretions are frequently observed [XII]. These risks have led some surgeons, especially in Asia, to favor total parenteral nutrition (TPN), which avoids enteral access but carries significant risks including catheter-related bloodstream infections, liver dysfunction, and increased healthcare costs [XIII]. In response to these challenges, a modified technique during Ivor-Lewis esophagectomy, which avoids the formal creation of a jejunostomy while still allowing for enteral feeding through a simpler, less invasive intraoperative tube placement [XIV]. This method has been routinely used at our institution for the past four years with promising outcomes. The aim of this retrospective study is to compare postoperative morbidity, mortality, and nutritional complications in patients undergoing Ivor-Lewis esophagectomy with versus without feeding jejunostomy, in order to evaluate the safety, efficacy, and clinical feasibility of this alternative nutritional strategy.

Methodology & Materials:

This retrospective comparative cross-sectional study was carried out in the Department of Thoracic Surgery at the National Institute of Diseases of the Chest and Hospital (NIDCH), Mohakhali, Dhaka, Bangladesh, over a period spanning from January 2022 to June 2023. The study included 70 patients with histologically confirmed esophageal carcinoma who underwent Ivor Lewis esophagectomy. Participants were divided into two groups based on whether a feeding jejunostomy was performed during surgery:

Group A (n=30): Patients who underwent Ivor Lewis esophagectomy without feeding jejunostomy.

Group B (n=40): Patients who underwent Ivor Lewis esophagectomy with feeding jejunostomy.

Inclusion Criteria

- Patients undergoing Ivor Lewis esophagectomy for carcinoma of the esophagus.
- Individuals of any age and gender who provided written informed consent.

Exclusion Criteria

- Patients with pre-existing chronic kidney disease.

- Those diagnosed with other simultaneous malignancies.
- Individuals with a history of abdominal surgery.
- Patients unwilling to participate.

Ethical Considerations

The study adhered to the ethical principles set forth in the Declaration of Helsinki (2011). Prior to participation, all patients received full information about the study and provided written informed consent. Confidentiality was strictly preserved throughout the study. Ethical approval was obtained from the Institutional Review Board of NIDCH, along with administrative permissions from appropriate hospital departments.

Data Collection

Patient data were collected retrospectively from medical records using a structured proforma. Baseline characteristics such as age, sex, body mass index (BMI), and preoperative albumin levels were documented. Disease-related variables including tumor pathology was also recorded.

All patients underwent a standardized Ivor Lewis esophagectomy, which consisted of a laparotomy in the supine position for gastric mobilization, followed by a right posterolateral thoracotomy in the lateral decubitus position to mobilize the esophagus and perform an intrathoracic esophagogastric anastomosis. In Group B, a feeding jejunostomy was created using the Witzel technique with a soft feeding tube. Group A did not receive feeding jejunostomy. Operative time and intraoperative findings were recorded. Following surgery, patients were kept nil per oral for 6 days. Group B patients began enteral nutrition via jejunostomy from postoperative day 3 or once bowel sounds returned, while Group A patients received parenteral nutrition. On postoperative day 7, a contrast swallow study was performed to assess anastomotic integrity prior to initiating oral feeding. Postoperative complications were documented. Other outcomes included operative duration, length of hospital stay, and intensive care unit (ICU) stay. Additionally, the 30-day readmission rate and body weight at the time of discharge were recorded. Furthermore, the study examined 30-day mortality and in-hospital mortality to assess short-term survival outcomes following Ivor Lewis esophagectomy with and without feeding jejunostomy.

Statistical Analysis

Data were analyzed using SPSS version 25. Continuous variables were presented as mean ± standard deviation (SD) and compared using independent sample t-tests. Categorical data were summarized as frequencies and percentages, with comparisons performed using the chi-square test. A p-value d" 0.05 was considered statistically significant.

Result

The study included a total of 70 patients, with 30 in Group A and 40 in Group B. As outlined in Table 1, the mean age was 55.7±10.4 years in Group A and 55.3±9.87 years in Group B. Male patients constituted 73.3% in Group A and 80.0% in Group B, while females accounted for 26.7% and 20.0%, respectively. The mean body mass index was 22.32±3.67 kg/m^2 in Group A and 22.21±4.54 kg/m^2 in Group B. Preoperative hypoalbuminemia (albumin <3.5 g/dL) was noted in 33.3% of Group A and 30.0% of Group B. Squamous-cell carcinoma was the predominant tumor type in both groups, seen in 86.67% of Group A and 90.00% of Group B, followed by adenocarcinoma in 13.33% and 10.00% (Table 2). The mean operation time was 296.00±28.11 minutes in Group A and 336.25±40.11 minutes in Group B. The mean duration of hospital stay was 13.87±3.19 days in Group A and 14.18±7.53 days in Group B. ICU stay was nearly similar in both groups. Readmission within 30 days was reported in 13.33% of Group A and 10.0% of Group B. The mean discharge weight was 44.2±7.53 kg in Group A and 46.5±9.27 kg in Group B (Table 3).Postoperative complications showed no significant differences between groups for anastomotic leakage, reflux esophagitis, or delayed gastric emptying. However, skin corrosion and ulceration were significantly higher in Group B (p = 0.04) (Table 4). As shown in Table 5, 30-day mortality was reported in 6.67% of Group A and 5.00% of Group B, while in-hospital mortality occurred in 10.00% and 5.00%, respectively.

Table-I

Baseline characteristics of the study population (N=70)

Variables	Group A (n=30)		Group B (n=40)		P-value
	n	%	n	%	
Age (years), Mean±SD	55.7±10.4		55.3±9.87		0.86
Gender					
Male	22	73.3	32	80.00	0.51
Female	8	26.7	8	20.00	
Body mass index (kg/m2)	22.32 ± 3.67	22.21 ± 4.54	0.05		
Preoperative Albumin <3.5	10	33.3	12	30.00	0.69

Cite as: Baseline demographic and nutritional status were comparable between groups (Table I).

Table-II

Disease characteristics of the study population (N=70)

Tumor Pathology	Group A (n=30)		Group B (n=40)		P-value
	n	%	n	%	
Squamous-cell carcinoma	26	86.67	36	90.00	0.09
Adenocarcinoma	4	13.33	4	10.00	

Cite as: The majority of patients in both groups had squamous-cell carcinoma (Table II).

Table-III

Comparison of postoperative parameters between Group A and Group B patients (N=70)

Variables	Group A (n=30), Mean±SD	Group B (n=40), Mean±SD	P-value
Operation time (minutes)	296.00±28.11	336.25±40.11	0.05
Hospital stay (days)	13.87±3.19	14.18±7.53	0.04
ICU stay (days)	3.0 ± 2.0	3.2 ± 1.9	0.59
30-day readmission (%)	4 (13.33%)	4 (10.0%)	0.76
Weight during discharge	44.2±7.53	46.5±9.27	0.31

Cite as: Group B had a significantly longer operation time and hospital stay compared to Group A, though ICU stay, readmission, and discharge weight were similar (Table III).

Table-IV

The incidence of post-operative complication among patients (N=70)

Variables	Group A (n=30)		Group B (n=40)		P-value
	n	%	n	%	
Anastomotic leakage	0	0.00	1	2.50	0.07
Reflux esophagitis	2	6.67	2	5.00	0.22
Functional delayed gastric emptying	1	3.33	0	0.00	0.08
Skin corrosion and ulceration	0	0.00	4	13.33	0.04

Cite as: Skin complications were observed only in the FJ group, reaching statistical significance (Table IV).

Table-V

Postoperative Mortality (30-day)

Mortality	Group A (n=30)		Group B (n=40)		P-value
	n	%	n	%	
30-day mortality	2	6.67	2	5.00	0.24
In-hospital mortality	3	10.00	2	5.00	0.28

Cite as: No statistically significant difference in 30-day or in-hospital mortality was observed between the groups (Table V).

Discussion

The Ivor Lewis esophagectomy remains a complex surgical procedure with significant risks of postoperative morbidity and mortality, which may be influenced by the use of feeding jejunostomy[15]. This retrospective analysis compared postoperative morbidity and mortality after Ivor Lewis esophagectomy with and without feeding jejunostomy (FJ) in well-matched groups, providing important insights into the role of routine FJ placement in esophageal cancer surgery.

Baseline demographic parameters, including age (55.7±10.4 vs 55.3±9.87 years; p=0.86), gender distribution (male predominance: 73.3% vs 80%; p=0.51), BMI (22.32±3.67 vs 22.21±4.54 kg/m^2; p=0.05), and preoperative hypoalbuminemia rates (33.3% vs 30%; p=0.69), were statistically comparable between groups. These similarities confirm a balanced study population and eliminate baseline nutritional or physiological status as confounders—consistent with matching approaches used in previous studies[16,17]. Tumor-related parameters also showed no significant intergroup difference. Tumor pathology (predominantly squamous cell carcinoma: 86.7% vs 90%; p=0.09) was equivalent. These findings resemble the patient profiles described in the study by Markar et al., who also emphasized the necessity of balancing tumor burden when evaluating postoperative strategies [18].

While the operation time was notably longer in the FJ group (336.25±40.11 min vs 296.00±28.11 min; p=0.05), this aligns with previous findings where the jejunostomy procedure added operative complexity and time[19]. Despite the extended surgery, ICU stay duration (3.2 ± 1.9 vs 3.0 ± 2.0 days; p=0.59) and weight at discharge (46.5±9.27 vs 44.2±7.53 kg; p=0.31) were comparable. Interestingly, length of hospital stay was slightly longer in the FJ group (14.18±7.53 vs 13.87±3.19 days; p=0.04), possibly reflecting a more cautious postoperative approach due to the presence of enteral access devices.

Our study noted no statistically significant differences in 30-day readmission rates (13.33% vs 10%; p=0.76), again suggesting that FJ use did not improve short-term convalescence. These results correspond with previous reports by Al-Temimi et al., who showed no significant differences in mortality, serious morbidity, length of stay, readmission rates, or anastomotic leak rates between the FJ and non-FJ groups, despite a longer operative time and increased superficial wound infections in the FJ group[20].

However, one notable adverse event in the FJ group was skin corrosion and ulceration (13.33% vs 0%; p=0.04), which directly implicates jejunostomy tube-related complications. This finding mirrors those from Gong et al., who described tube-related skin issues in up to 10% of cases[21]. Other complications, including reflux esophagitis (6.67% vs 5%; p=0.22), delayed gastric emptying (3.33% vs 0%; p=0.08), and anastomotic leakage (0% vs 2.5%; p=0.07), were not significantly different between groups. While the incidence of anastomotic leak was low overall, our result supports findings from Lee et al., suggesting that jejunostomy does not significantly reduce leak rates[22].

The 30-day mortality was similar in both groups (6.67% vs 5%; p=0.24), and in-hospital mortality showed no significant difference (10% vs 5%; p=0.28). These mortality rates are consistent with contemporary surgical literature on Ivor Lewis esophagectomy, which reports 30-day mortality ranging between 3–10%[20]. Thus, FJ placement does not appear to offer a survival benefit in this surgical context.

Our results align with a growing body of literature that questions the routine use of feeding jejunostomy during Ivor Lewis esophagectomy. While FJ can provide nutritional security, particularly in high-risk or malnourished patients, its universal application may expose patients to device-specific complications without significant benefits in reducing leak rates, hospital stay, or mortality. In the present study, although the FJ group experienced slightly longer operations and unique complications (e.g., skin ulcers), overall outcomes including morbidity and mortality were equivalent to the non-FJ group[22].

Limitations of the study:

- The study duration was short, making it difficult to assess long-term complications, nutritional outcomes, or survival.
- Being retrospective in nature, potential selection and information biases could not be completely eliminated.

Conclusion and Recommendations

The findings of this study suggest that the use of feeding jejunostomy during Ivor Lewis esophagectomy does not confer significant benefits in terms of reducing morbidity or mortality. While jejunostomy provides a secure route for postoperative nutrition, it may be associated with specific complications such as skin ulceration. On the other hand, the absence of jejunostomy did not lead to increased anastomotic leak or mortality rates. Therefore, the decision to place a feeding jejunostomy should be individualized, reserving it for patients at high nutritional risk or anticipated prolonged recovery. Further multicenter, prospective studies with larger sample sizes and longer follow-up are needed to validate these findings.

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