Can esophagogastric anastomosis in Robotic Ivor Lewis esophagectomy be improved with a robotic stapler?

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Introduction

Esophageal cancer remains a largely fatal malignancy, with overall five-year survival ranging from 15% to 20%. Since the introduction of robotic systems in esophageal cancer surgery, the minimally invasive surgical approach is getting more acceptance as the best treatment modality. Formerly esophagogastric anastomosis was performed with either a hand-sewn technique or a circular stapler. The recent introduction of a robotic stapler seeks to reduce postoperative complications and improve patient outcomes. This study aimed to compare our robotic versus circular stapler anastomosis peri-operative data and outcomes.

Methodology

A retrospective review of our medical records identified 49 patients who underwent robotic Ivor Lewis esophagectomy from November 2012 to February 2023. Perioperative data and patient outcomes were assessed by retrospective review of a prospectively maintained database.

Results

49 patients (42 males [85.7%]) underwent a robotic Ivor Lewis esophagectomy. In 21 patients, a robotic linear stapler was used for anastomosis, and in 28 patients, a circular stapler was utilized. Groups were homogenous in all demographic and operative parameters. Compared to the circular stapler, the linear stapler group had a shorter length of stay (11.6±3.8 vs. 19.3±12.67 days, p=0.004), lower frequency of the anastomotic leak occurrence (0.0% vs. 17.9%, p=0.042) and reduced postoperative complication rates (23.8% vs. 39.3%, p=0.237). 30-day mortality was lower in the linear stapler group (0% vs. 7.1%; p=0.243).

Conclusions

In our experience, a new generation linear stapler for Ivor Lewis esophagectomy is associated with **lower anastomotic leak rates and reduced length of stay.**

Table 1. Circular versus linear stapler for esophagogastric anastomosis in Ivor Lewis esophagectomy.

Variable		Circular stapler (n = 28)	Linear stapler (n = 21)	p-value
Mean operative time (min)		365.8±24.7	377.1±37.8	0.594
EBL (mL)		109.5±140.2	105.6±116.4	0.968
Lymph nodes harvested		11.0±5.4	13.7±7.7	0.182
R0 Resection margins		22 (91.7%)	18 (90.0%)	0.852
Intraoperative complications		1 (3.6%)	0 (0.0%)	0.395
Conversion		0 (0.0%)	0 (0.0%)	1.000
Overall morbidity		11 (39.3%)	5 (23.8%)	0.237
Clavien Dindo				
	I	2 (7.1%)	0 (0.0%)	0.662
	II	3 (10.7%)	3 (14.3%)	
	IIIa	0 (0.0%)	1 (4.8%)	
	IIIb	0 (0.0%)	0 (0.0%)	
	IV	0 (0.0%)	0 (0.0%)	
	V	2 (7.1%)	0 (0.0%)	
Anastomotic leakage		5 (17.9%)	0 (0.0%)	**0.042**
Reoperation		0 (0.0%)	0 (0.0%)	1.000
Length of stay (days)		19.3±12.67	11.6±3.8	**0.004**
30-day mortality		2 (7.1%)	0 (0.0%)	0.243
Histological Diagnosis				
	Adenocarcinoma	21 (75.0%)	15 (71.4%)	0.856
	Squamous Cell Carcinoma	5 (17.9%)	6 (2.9%)	
	Leiomyoma	1 (3.6%)	0 (0.0%)	

EBL - estimated blood loss; LOS - length of stay