



Improving postoperative outcomes in esophagectomy for cancer – what is the role of institutional data?

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Dr. Park and colleagues (1) present the findings from retrospective review of 291 patients who underwent esophagectomy and mediastinal lymphadenectomy for intended curative treatment of esophageal cancer at a single institution. Specifically, the investigators analyzed postoperative 30-day readmission over a >10-year period to identify the incidence of and risk factors that predispose patients to readmission after undergoing esophagectomy. They focused on factors related to, and predictors of readmission. They “*hypothesized that specific but not all complications might be related to readmission.*” Their outcomes are notable for high rates of vocal cord palsy, ascribed by the authors to mediastinal lymph node dissection, and long hospital stay (median 17 days, mean 25.6 days). However, their anastomotic leak rate was 10%, which is what we typically quote patients during the informed consent process and supported by the literature (2). The mean time from discharge to readmission was about 14 days. Significant univariate characteristics identified through logistic regression analysis were included as covariates in multivariable modeling to determine significant risk factors for readmission. The study identified 39 (13.4%) patients readmitted and concluded the only independent risk factor for readmission was postoperative anastomotic leak (odds ratio 2.884, 95% CI: 1.133–7.343, P=0.026). These patients had significantly higher rates of readmission due to wound

problems and anastomotic stricture compared to patients not experiencing anastomotic leak. They did not identify a relationship between vocal cord palsy and postoperative readmission. The authors suggest improvements in surgical techniques aimed at reducing anastomotic leakage and wound problems are means for improvement of surgical outcomes.

Other notable points in the study are the cohort demonstrating the geographic variation of esophageal cancer: >90% of patients were male, >95% were treated for squamous cell carcinoma, and >60% had disease in the upper or mid esophagus. This differs from the typical population encountered in the US and Europe where there are more equal distributions of esophageal cancer across males and females, a higher incidence of esophageal adenocarcinoma, than squamous cell carcinoma, and a higher proportion of esophagogastric junction tumors (3). Dr. Park and colleagues also outline their perioperative care paradigm. There are as many variations to this as there are esophageal surgeons, highlighting the need for research to delineate best practices. Only 14% of the patients studied in Dr. Park and colleague’s analysis underwent neoadjuvant therapy, despite more than half having pathologic staging beyond stage I (presumably some of the pathologic stage 0 and I patients received neoadjuvant therapy as well). This is surprising given the National Cancer Center Network

Table 1 Frequency and rate of 30-day postoperative complications in 4,220 patients undergoing esophagectomy for esophageal cancer

Complication	Frequency (N)	Rate, % (N/4,220)
Mortality	107	2.54
Overall morbidity	1,831	43.39
Unplanned, related readmission	419	9.93
Infectious complications	654	15.50
Pulmonary complications	943	22.35

Total of 4,220 case records obtained from the 2012–2018 American College of Surgeons National Surgical Quality Improvement Program Participant User File.

guidelines recommend neoadjuvant chemoradiation therapy for most tumors greater than T1bN+ and T2N0 but may reflect local practice (4). The use of neoadjuvant therapy, especially radiation, is associated with increased esophagogastric anastomotic complications (5).

Esophagectomy for esophageal cancer is associated with high rates of morbidity and mortality compared to surgical treatments for other cancers. While much of the data laying the foundation for medicine and surgery are based on case series and single institution databases, the evolution of regional, national and international data registries has enabled broader study of healthcare. One of the largest international clinical databases, the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP), currently reports data on >6 million operations performed at >800 hospitals (mainly U.S., but including hospitals in 11 other countries) since 2005 (6). Based on analysis of patients undergoing esophagectomy for esophageal cancer in the ACS NSQIP dataset between 2012 and 2018, the 30-day mortality and overall morbidity rates are 2.54% and 43.39%, respectively (*Table 1*). Furthermore, pulmonary and infectious complications occur with rates of 22.35% and 15.50%, thus accounting for a significant proportion of overall morbidity observed after esophagectomy. On our prior analysis of unplanned, related readmission after esophagectomy for cancer, we found that the occurrence of postoperative complications was significantly related to readmission within 30 days of the operation and that 59% of patients were readmitted within the first week, and 90% by two weeks after discharge (7). Readmission and reoperation in patients having undergone esophagectomy are largely related to post discharge complications. Wound infection, VTE, and organ space SSI are more common in patients with post discharge complications (8). Infectious,

pulmonary, and gastrointestinal complications are leading causes of readmission following esophagectomy (7). Esophageal surgeons surely are aware of this from their own experiences.

Dr. Park and colleagues found anastomotic complications as an independent predictor of readmission, but that recurrent laryngeal nerve palsy was not. Perhaps the latter finding is predictable, as vocal cord dysfunction typically presents while an inpatient, and can be managed reliably as an outpatient (9,10). However, esophagogastric anastomotic leaks have multiple short- and long-term sequelae that affect patients. These include superficial, deep and organ space surgical site infections, esophago-tracheal and bronchial fistulas, pneumonia, intrathoracic sepsis, inability to tolerate oral alimentation, stricture formation, and rarely the need for esophageal diversion and delayed complex reconstruction. The challenges of anastomotic leak have led to extensive research and formation of international collaboratives to better understand these, such as the Oesophago-Gastric Anastomosis Audit (11) and Thoracic Surgery Outcomes Research Network (12).

Dr. Park and colleagues are to be commended for investigating risk factors predisposing esophageal cancer patients to readmission following esophagectomy. This work represents an important step in identifying targets for quality improvement efforts and resource allocations. However, this study has some limitations including analysis of a homogenous population at a single institution and regional considerations including pathology and operative technique. Studies utilizing larger database populations have demonstrated significantly higher rates of infectious complications and VTE (7,8,13). Institutional data should not supplant studies of large populations but rather be used as a supplement to identify local opportunities and guide institutional quality improvement efforts in addition to

providing a perspective on local challenges which may be broadly applicable.

Dr. Park and colleagues have provided an important analysis of their institutional experience with esophagectomy for cancer, highlighting their perioperative pathway, common complications, and causes of readmission. This is an example of the need for surgeons to maintain local databases and participate in national and international efforts aimed at collating these data. This also emphasizes the need for accurate tracking of clinically meaningful data and outcomes, as opposed to reliance on administrative datasets or misapplication of clinical datasets intended for capture of nonsurgical outcomes. We advocate the utilization of large population studies to establish generalized guidelines for postoperative management of esophagectomy patients but incorporating unique institutional data to refine system and surgeon best practices to optimize patient outcomes. As Dr. Park and colleagues suggest, improvements in surgical technique are an important step to reducing morbidity and mortality in patients undergoing esophagectomy. However, devoting resources and adjusting practices to eliminate common complications following esophagectomy for esophageal cancer must remain a goal. Given the increased scrutiny on resource utilization and healthcare expenditures related to postoperative readmission, the identification of high-risk patients, quality improvement opportunities, and targeted resource allocation offer benefit to patients, providers, and healthcare institutions alike.

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Footnote

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