cavity and deliver enteral nutrient from a distal point nasally (Fig 3B). The treatment was effective, and the patient recovered smoothly.

In conclusion, we encountered a very rare case of anastomotic leakage followed by lung fistula after esophagectomy, managed successfully with a W-ED tube. We consider that the W-ED tube was very effective for the treatment of this patient because it facilitated decompression of the gastric conduit and administration of sufficient parenteral nutrition.

References


Extracorporeal Membrane Oxygenation Support After Ivor-Lewis Esophagectomy for Esophageal Adenocarcinoma

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Respiratory failure after Ivor-Lewis esophagectomy results in poor outcomes. Limited treatment strategies are available to manage this severe complication. One possibility is extracorporeal support. We report the successful use of extracorporeal support as a successful strategy for refractory respiratory failure.

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Esophageal carcinoma is one of the deadliest cancers worldwide. At the time of diagnosis, more than half of patients have either unresectable tumors or radiographically visible metastases [1]. Neoadjuvant chemotherapy and radiation therapy have become more prevalent given their survival benefit, as shown in recent randomized clinical trials [2–4]. Unfortunately, this has been accompanied by an increased incidence of respiratory complications, including refractory respiratory failure [4, 5]. The need for supporting refractory respiratory failure leading to the possible use of extracorporeal membrane oxygenation (ECMO), has emerged as a new treatment for refractory respiratory failure, yet its exact role is still evolving. The ECMO was originally reserved for patients at substantial risk of death [6]. However, the use of ECMO has recently broadened to include rescue therapy for respiratory failure [6].

Here we describe a patient who was successfully treated with ECMO for severe respiratory failure post-Ivor Lewis esophagectomy. We report the clinical features of this case to discuss the possible future role of ECMO after complex foregut surgery.

A 48-year-old man with a 40-lb weight loss, greater than 50 pack-year smoking history, and emphysema presented with worsening dysphagia (Fig 1). After endoscopic biopsy he was diagnosed with poorly differentiated adenocarcinoma. The tumor measured 10 × 4.0 × 3.5 cm, with local invasion of the pericardium, aortic wall, and mediastinal pleura. Based on imaging it was staged T4N1Mx (Fig 1). Neoadjuvant Taxotere (Sanofi-Aventis, Bridgewater, NJ) and 5040 cGy of radiation therapy were given, and a percutaneous endoscopic
gastrostomy tube was placed for nutritional support. After 3 months, the tumor had reduced to 3 cm and restaged as T3N0M0. This prompted a referral for surgical resection. The preoperative reduced pulmonary function tests showed a forced expiratory volume in first second or expiration of 2.4 l at 65% of predicted, and diffusing capacity of lung for carbon monoxide at 54%. The patient was taken for an uncomplicated Ivor-Lewis esophagectomy. However, on postoperative day 1, arterial oxygen desaturated quickly necessitating reintubation. Despite 100% fraction of inspired oxygen and increased positive end-expiratory pressure, the blood gas persistently demonstrated high Aa-gradens and hypoxemia. Despite ARDSnet protocol ventilation, subcutaneous emphysema, air leak, and pneumothorax developed (Fig 2), prompting placement of 2 additional chest tubes. Bronchoscopy was performed and noted thick secretions. Over the following days, the ventilation mode was switched to high frequency oscillator jet ventilation and nitric oxide (25 to 35 ppm) was added. However, the patient remained persistently hypoxic. Consequently, the decision was made to start extracorporeal lung assistance with peripheral ECMO support. A transthoracic echocardiography revealed normal biventricular contractility, no patent foramen ovale, or evidence of central thrombus. The ECMO was instituted through cannulation of the right and left femoral veins. A 22F venous cannula was placed for drainage and return was established with an 18F venous cannula. A Quadrox D membrane oxygenator (MAQUET Medical Systems, Wayne, NJ) was used; ECMO was set at 2,200 rpm and flow 3.4 L/minute was established.

Arterial blood gases showed marked improvement after initiating ECMO. His further course was notable for streptococcus, which was treated with appropriate antibiotics. As the air leakage from chest tubes resolved, chest X-rays showed resolution of the pneumothorax. After 4 days the patient no longer required ECMO and was weaned (Fig 3), without complications. Subsequently, ventilator support with acute respiratory distress syndrome protocol was started. Three weeks later, tracheostomy was performed. The patient was
discharged to a rehabilitation facility on postoperative day 31. One month later, the tracheostomy and feeding jejunostomy tube were removed. He was well during the 6 months follow-up (Fig 4).

Comment
Neoadjuvant chemoradiation places patients at particularly high risk of developing respiratory failure after esophagectomy [7]. In this patient the etiology of respiratory failure was multifactorial. He had preoperative induction chemotherapy, was a chronic smoker and had significant lung disease. He developed early Streptococcus pneumoniae post esophagectomy which contributed to his acute decompensation. Therefore, the management of this group of patients is particularly challenging. One possible management strategy is the use of ECMO.

Here we describe a case of a 48-year-old patient with refractory hypoxemia after Ivor-Lewis esophagectomy, who was successfully treated with ECMO. In this case, respiratory failure was not responsive to multiple ventilatory support strategies. Given this, we started the patient on ECMO support. ECMO was required for only 3 days as the hypoxia resolved and returned to ventilatory support. The use of ECMO for respiratory failure after foregut surgery has so far been rare. To our knowledge this is the first report of using ECMO after Ivor-Lewis esophagectomy.

Data concerning the application of ECMO support after gastrointestinal surgery are still lacking, although the outcome from this reported case is encouraging. Extracorporeal support in the treatment of respiratory failure after foregut surgery warrants further investigation, and may be beneficial as a salvage strategy.

References

Collision Tumor of Esophagus: Report of Three Cases
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Collision tumors are rare, and they are not well-recognized entities. Collision tumors of the esophagus are rarer. Here we report 3 patients with esophageal collision tumors and discuss their characteristics.

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Case Reports
Patient 1
A 60-year-old man was admitted who had experienced dysphagia for half a month accompanied by substernal pain. Nothing abnormal was found on physical examination. Gastroscopy revealed an ulcerative lesion 27 to 30 cm away from the incisors. Examination of the biopsy specimens suggested a diagnosis of squamous cell carcinoma. Esophagectomy was carried out, and a 3 × 3 cm mass and enlarged paraesophageal and subcarinal lymph nodes were observed during the operation. Microscopic examination (Fig 1) demonstrated an infiltrative malignant neoplasm composed of squamous cell carcinoma and small cell carcinoma. There was no transition between the two types. The cells of squamous cell carcinoma were homogeneous in dimension and were arranged in nests. Keratin pearls could be seen in some nests. The other type of the tumor was composed of cells with small round, spindle-shaped, or oat-shaped nuclei and scanty cytoplasm, and the cells had a diffuse growth pattern. The tumor invaded the outer muscularis, and there was cancerous metastasis in one of six paraesophageal lymph nodes and three of seven other lymph nodes. There was no evidence of organ metastasis. The patient died of pulmonary metastasis after 17 months.

Patient 2
A 66-year-old man was hospitalized who had experienced dysphagia for a 1-month history of progressive substernal pain accompanied by progressive dysphagia. The results of the physical