

## CASE REPORT

# Simultaneous pneumonectomy and esophagectomy in an elderly patient

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## Keywords

Esophageal neoplasms; esophagectomy; lung neoplasms; pneumonectomy.

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## Abstract

Reports of simultaneous pneumonectomy and esophagectomy for synchronous lung and esophageal carcinoma are extremely rare. We report on a 64-year-old male patient with lung adenocarcinoma who was originally scheduled to undergo a left pneumonectomy. During the operation, an esophageal squamous cell carcinoma was discovered in the mid-thoracic esophagus. Thus, a simultaneous left pneumonectomy and esophagectomy was performed, and part of the pericardium was sutured to the tunica adventitia of the descending aorta using a “net-making” method for prevention postoperative dilatation of the stomach.

## Introduction

Primary lung tumors are associated with esophageal squamous cell carcinoma in up to 3% of patients.<sup>1</sup> Although surgical resection is the preferred and most effective treatment for both lung and esophageal carcinoma in suitable patients, selecting treatment for synchronous lung and esophageal carcinoma (SLEC) is clinically difficult because of the tremendous surgical wound and the high risk of morbidity and mortality. We report a rare case of SLEC that was treated successfully with simultaneous pneumonectomy and esophagectomy (SPE).

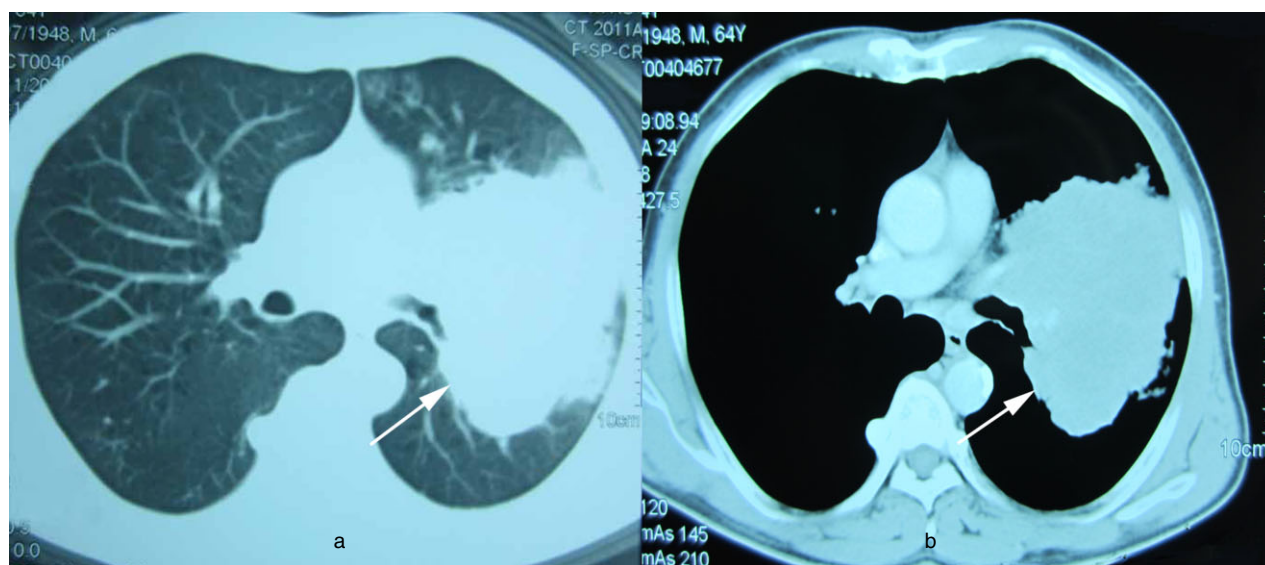
## Case report

A 64-year-old male patient presented with a four-month history of cough and bloody sputum, and a five kilogram weight loss without dysphagia. He had smoked one pack of cigarettes per day for 40 years. Chest contrast-enhanced computed tomography (CT) (Fig. 1) demonstrated an ill-defined margin mass measuring approximately 9.3 cm × 11.6 cm in the left hilum and displayed a mediastinal lymph node (LN). The left pulmonary artery and the superior pulmonary vein were both invaded and narrowed by the tumor on the CT scan. There was nothing remarkable on the CT scan regarding the esophagus. Bronchoscopy revealed that the neoplasm, with involvement of the lower-lobe orifice, obstructed the left

upper-lobe bronchus. A biopsy of the tumor showed adenocarcinoma. Further investigation, including abdominal CT scan, brain magnetic resonance imaging (MRI), and single photon emission computed tomography scan of the bone did not reveal any evidence of distant metastases. Preoperative cardiopulmonary function tests confirmed that the patient could tolerate a left pneumonectomy.

The operation was carried out with posterolateral thoracotomy through the fourth intercostal space. A large tumor was found in the left upper-lobe, which involved the lower-lobe, the left main pulmonary artery, and part of the pericardium. A left pneumonectomy with partial pericardectomy and lymphadenectomy of levels 4, 5, 6, 7, 8, 9, and 10 LNs was performed.

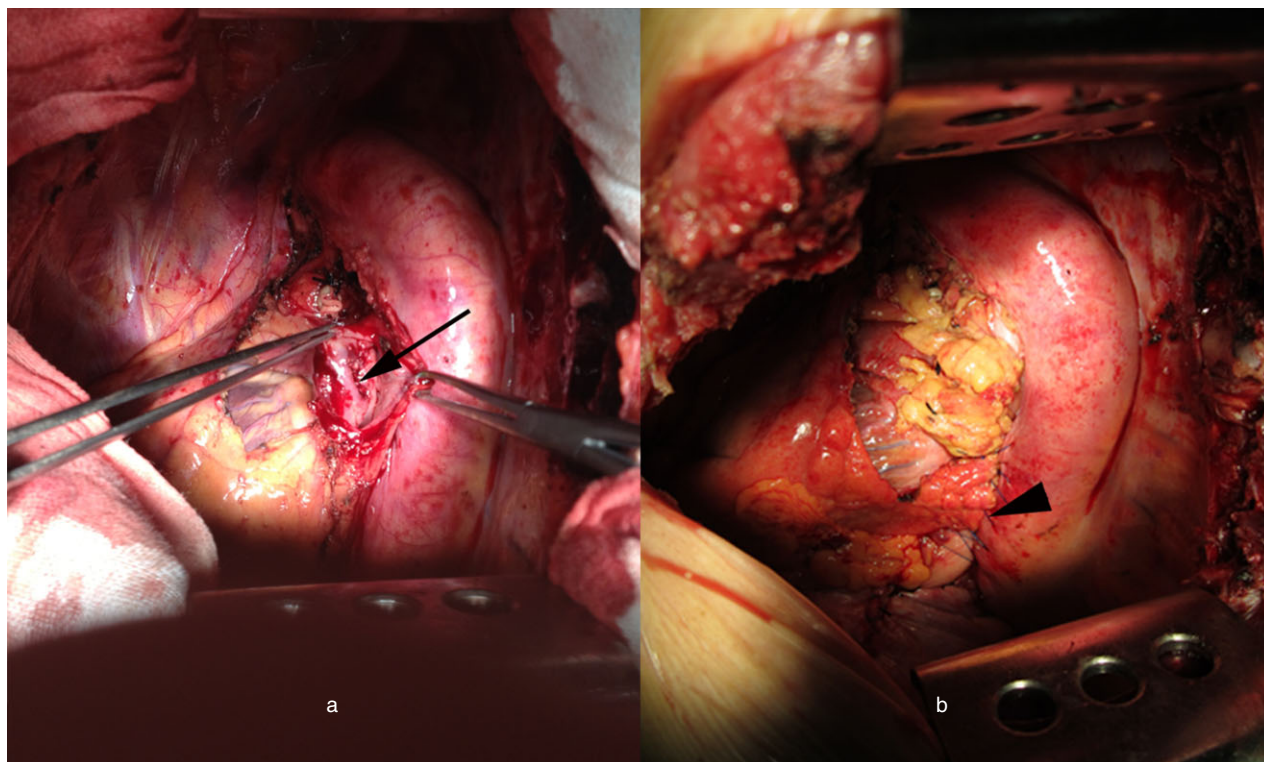
During the process of mediastinal lymphadenectomy, an indurated mid-esophageal mass approximately 2.0 cm distant from the carina was explored (Fig. 2a). Dissection of the lesion from the esophagus demonstrated a reddish, ulcerated exophytic neoplasm as seen on the mucosal surface, observed to be approximately 2.5 cm in diameter, which is irregular, and was confirmed as squamous cell carcinoma by intraoperative frozen section. A synchronous esophagectomy with regional lymphadenectomy of levels 15, 16, and 17 LNs was carried out after carefully re-evaluating the patient's preoperative cardiopulmonary function tests and obtaining additional informed consent from his family members. Esophagogastrostomy was performed using an arcus stapler posterior to the aortic arch



**Figure 1** Chest computed tomography (CT) scan shows a large inhomogeneous mass in the left hilum (arrow), but nothing is remarkable about the esophagus. (a) Pulmonary window. (b) Mediastinal window.

through the same incision as the pneumonectomy, without repositioning the patient (Sweet procedure). The anastomotic stoma was wrapped using the greater omentum. Meanwhile, the intrathoracic stomach was positioned in the posterior

mediastinum in the esophageal bed by suturing part of the pericardium to the tunica adventitia of the descending aorta using a “net-making” method (Fig. 2b). All of the surgical margins were confirmed negative by frozen section.



**Figure 2** (a) An ulcerated exophytic neoplasm is found on the mucosal surface of the esophagus after an exploration of the esophageal cavity (arrow). (b) Suturing part of the free pericardium to the tunica adventitia of the descending aorta by using a “net-making” method (arrow).



**Figure 3** Chest roentgenogram on the fifth postoperative day shows massive pleural fluid in the left chest with the mediastinum shifted to the left without postoperative dilatation of the stomach.

Pathological diagnosis of the lung tumor and the esophageal tumor were moderately differentiated adenocarcinoma and poorly differentiated squamous cell carcinoma, respectively. The depth of the esophageal tumor invasion extended to the muscularis propria. Only two of the subcarinal LNs were involved, with metastatic adenocarcinoma among the 32 LNs dissected. The definitive pathological stage of lung cancer and esophageal cancer was pT3N2M0 and pT2N0M0, respectively. Chest roentgenogram showed that the pneumonectomy space was full of pleural fluid without postoperative dilatation of the stomach, and the mediastinal structures shifted to the left side on the fifth postoperative day (Fig. 3). The patient began to take fluids on postoperative day eight, and the naso-gastric tube was removed on postoperative day 10. Over the following three weeks, he steadily returned to a normal diet. He made a full and uneventful recovery from the procedure and was discharged home on the eighteenth postoperative day. The patient is currently alive without any tumor recurrence five months since discharge, and is receiving adjuvant chemotherapy.

## Discussion

Simultaneous esophagectomy and lung lobectomy for the treatment of SLEC have been reported previously,<sup>2</sup> but

only three cases of SPE in the presence of centrally located bronchial carcinoma involving esophagus or esophageal carcinoma invading the main bronchus have been reported in English literature.<sup>3,4</sup> However, SPE performed for SLEC has never been reported. The case described in this paper was first diagnosed with a centrally located lung carcinoma. An unexpected synchronous esophageal carcinoma was found after a left pneumonectomy was performed. Esophagectomy after pneumonectomy is challenging,<sup>5</sup> and it is quite difficult to determine whether synchronous esophagectomy is suitable. After re-evaluating the patient's preoperative cardio-pulmonary function tests and obtaining additional informed consent from his family members, we performed a synchronous esophagectomy for the patient. Fortunately, the surgical procedure was uneventful. The patient had a T3-stage primary lung adenocarcinoma and ideally, a more strict preoperative staging assessment should have been performed for this patient. A positron emission tomography (PET) scan or other invasive procedures, such as cervical mediastinoscopy or endobronchial ultrasound guided transbronchial needle aspiration (EBUS-TBNA), would offer a more accurate stage prior to surgery. However, PET scans and EBUS-TBNA are not covered by Medicare. The patient and his family members were fully informed of the importance and alternatives for further preoperative assessment, but they finally refused the use of these procedures and the operation was carried out according to routine clinical assessment. In other circumstances, a PET scan may reveal both the synchronous esophageal carcinoma and the unexpected single-level N2 disease prior to surgery. This case also illustrates the importance of careful preoperative assessment.

Anastomotic leakage is a major reason for postoperative mortality following esophagectomy.<sup>6</sup> Because the ipsilateral chest could rapidly fill with pleural fluid after pneumonectomy, and the esophageal anastomotic stoma could, subsequently, be soaked by the fluid (which may increase the possibility of anastomotic leakage), several precautions were taken to prevent this problem during the operation. First, esophagogastrostomy was performed posterior to the aortic arch, and part of the free pericardium was sutured to the tunica adventitia of the descending aorta by using a "net-making" method. These methods restrict the stomach in the posterior mediastinum and prevent postoperative dilatation of the stomach, which may increase the tension of the anastomotic stoma. Meanwhile, we positioned the stomach in the esophageal bed and wrapped the anastomotic stoma with the greater omentum.

In conclusion, though quite rare, the presence of synchronous esophageal carcinoma should be taken into consideration for lung cancer patients. Even SPE can be safely performed in patients with SLEC through careful preoperative management.

## Disclosure

No authors report any conflicts of interest.

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