

An Autopsy Case of Acute Pulmonary Embolism after Lung Cancer Surgery

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The patient was a 77-year-old female who had difficulty breathing at 48 h after undergoing a right upper lobectomy for lung cancer and experienced sudden cardiopulmonary arrest. Emergency resuscitation was performed, and she was therefore put under artificial respiration, but she died 15 h after resuscitation. A pathological autopsy was performed upon obtaining informed consent from the family. An examination of the lungs in which the right upper lobectomy was performed detected multiple embolisms blocking the bilateral main pulmonary arteries to the periphery, and the cause of death was established as acute pulmonary embolism. The rate of occurrence of fatal pulmonary embolism after surgery is assumed to be 0.08%, but the rate of occurrence after thoracic surgery shows a high rate of 0.34%. It is important to implement early detection and the early treatment of pulmonary embolism that occurred by misfortune while also reviewing all risk assessments and preventive measures established under the medical guidelines in order to prevent such cases from becoming fatal.

Key words: autopsy; lung cancer operation; pulmonary embolism

In Japan, the rate of occurrence of acute pulmonary embolism has been increasing gradually in recent years as our daily lifestyle becomes more Westernized. We experienced a patient who suffered a fatal acute pulmonary embolism after surgery for lung cancer, and we performed an autopsy. We herein present our results with a brief discussion regarding the prevention and treatment of post-operative pulmonary embolism.

Patient Report

The patient was a 77-year-old female in whom an abnormal shadow was detected by chest computed tomography (CT) during medical examination, resulting in hospitalization in October 2007

for the purpose of surgery. She was 157-cm tall, weighed 62 kg and had a body mass index of 24.9. Her medical history included surgery for thyroid cancer 10 years earlier. She had no past history of smoking habit or diabetes mellitus and was a only regular user of antihypertensive and thyroid hormones (Thyroxine). Her blood pressure was 130/85 mmHg and there were no abnormal findings in the thyroid function, blood coagulative test and cardiopulmonary examination. So, we and the anesthesiologists judged this patient low risk for pulmonary embolism and did not perform the ultrasound examination on the veins in both lower limbs and intrapelvic area. A 3-cm tumor on the right upper lobe was detected in the chest CT scan (Fig. 1), and the patient was diagnosed

Abbreviation: CT, computed tomo-gram, -graphy

with pulmonary adenocarcinoma. She therefore underwent a thoracoscopic right upper lobectomy and a mediastinal lymph node dissection. The operation took 240 min to complete with 170 g of bleeding and an intraoperative massage using intermittent pneumatic compression applied to her lower limbs as her progress continued to improve. Postoperative pathological findings showed a well-differentiated adenocarcinoma without lymph node metastases, and we concluded the IA disease of tumor-node-metastasis staging. The patient's postoperative vital signs were stable, and she started taking meals in a seated position at 18 h after surgery. She had difficulty breathing at 48 h after surgery when she was moved to a general ward, but her condition recovered immediately after oxygen was administered. After dinner, a nurse discovered that the patient was experiencing respiratory arrest, so cardiopulmonary resuscitation was immediately applied, and the patient was moved to the Intensive Care Unit, where she was put on artificial respiration. Echocardiography findings indicated a suspected collapse of the left ventricle and embolisms within the pulmonary arteries, so it was assumed to be a case of pulmonary embolism, and therefore the intravenous administration of 48,000 units of urokinase and 5,000 units of heparin was carried out. However,



Fig. 1. In the preoperative chest computed tomogram, a 3-cm tumor with irregular margin on the right upper lobe was detected. We suspected lung adenocarcinoma.

we observed pupil dilation and a loss of light reflex, and the patient was pronounced dead 15 h after resuscitation. A pathological autopsy was performed after obtaining the informed consent from the family. Upon examining her lungs after the right upper lobectomy, we detected many embolisms blocking the bilateral main pulmonary arteries to the periphery (Figs. 2A and B). The resected embolisms were fresh red embolisms that were 55 × 7 mm in size on the right side and 60 ×

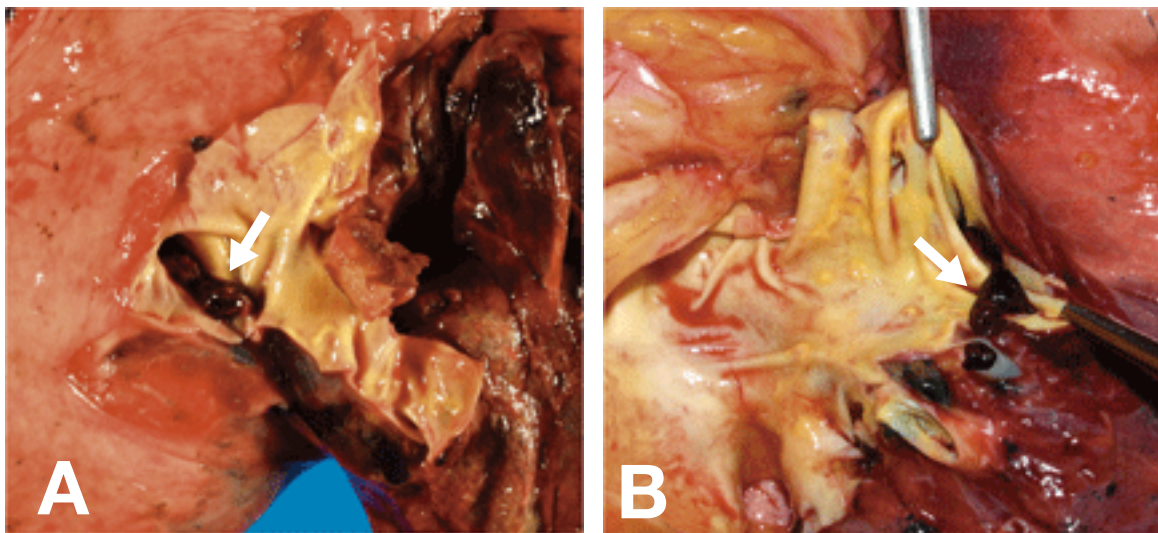


Fig. 2. Autopsy findings show many embolisms (arrows) blocking bilateral main pulmonary arteries to the periphery. **A:** Right lung. **B:** Left lung.