Case Report

Late-Period-Onset Chylothorax after a Pulmonary Resection for Lung Cancer: A Case Report

Ryuichi Suemitsu, MD,[1] Kaoru Ondo, MD,[2] Seiichi Fukuyama, MD,[2] and Hitoshi Ueda, MD[2]

A 65-year-old female had been diagnosed with right lung cancer by her family physician, and she was introduced to our Department of Thoracic Surgery at Matsuyama Red Cross Hospital in May 2004. She underwent a right upper lobectomy and wedge resection of S6 with the systematic dissection of her mediastinal lymph nodes. The patient made an uneventful recovery and was discharged on postoperative day 19. However, chylothorax was detected on a chest roentgenogram when she consulted our outpatient clinic again for dyspnea on exertion and chest pain. Chylothorax occured in postoperative day 34. The patient initially received conservative therapy, but subsequently underwent surgical treatment and fibrin glue intubation when conservative therapy proved to be unsuccessful. (Ann Thorac Cardiovasc Surg 2007; 13: 345–348)

Key words: chylothorax, late-period-onset, pulmonary resection, lymph node dissection

Introduction

Chylothorax is a relatively rare complication associated with thoracic surgery. It tends to occur in the early postoperative period for esophageal surgery, pulmonary resection with lymph nodes resection, and heart-lung transplantation.[1–3] The prevalence of chylothorax after cardiothoracic surgery ranges from 1–2%,[2,4] and mortality rate is approximately 50% without treatment.[5] It is usually right-sided, since most of the ducts are within the right hemithorax. However, when damage occurs at the level of the aorta, chyle will appear on the left. Usually the patient remains asymptomatic until a large amount of chyle accumulates in the pleural space. Such symptoms as dyspnea, tachypnea, and classic symptoms of pleural effusion are observed. Generally, the treatment of choice for a chylothorax patient with good nutritional status is conservative therapy with chest tube drainage and an enteral low-fat diet. If this treatment is ineffective, a ligation of the thoracic duct may then be performed. Conservative management for late-onset chylothorax after thoracic surgery has been reported to be of benefit for patients with good nutritional status.[3,6] We herein describe a case that developed late-onset chylothorax after pulmonary resection and mediastinal lymph node dissection, and as a result the patient underwent a thoracic duct ligation and pleurodesis with fibrin glue.

Case Report

A 65-year-old female experienced sudden-onset back pain, and a chest roentgenogram was taken by her family physician in December 2003. An abnormal shadow was recognized in the right upper lung field. She was diagnosed with pulmonary tuberculosis and was treated with antibiotics by her family physician. Since she did not respond to the therapy, she consulted another institution to obtain a second opinion. A chest computed tomography (CT) revealed a massive tumor in S2 and a small nodule in S6. Fiberoptic bronchoscopy (FOB) revealed almost normal findings, and a biopsy from B2 revealed squamous cell carcinoma. She was therefore admitted to our facility and thereafter in April 2004 underwent a right

[1]*Department of Thoracic Surgery, Clinical Research Institute, National Hospital Organization, Kyushu Medical Center, Fukuoka, and* [2]*Department of Thoracic Surgery, Matsuyama Red Cross Hospital, Matsuyama, Japan*

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Address reprint requests to Ryuichi Suemitsu, MD: Department of Thoracic Surgery, Clinical Research Institute, National Hospital Organization, Kyushu Medical Center, 1–8–1 Jigyohama, Chuo-ku, Fukuoka 810–8563, Japan.

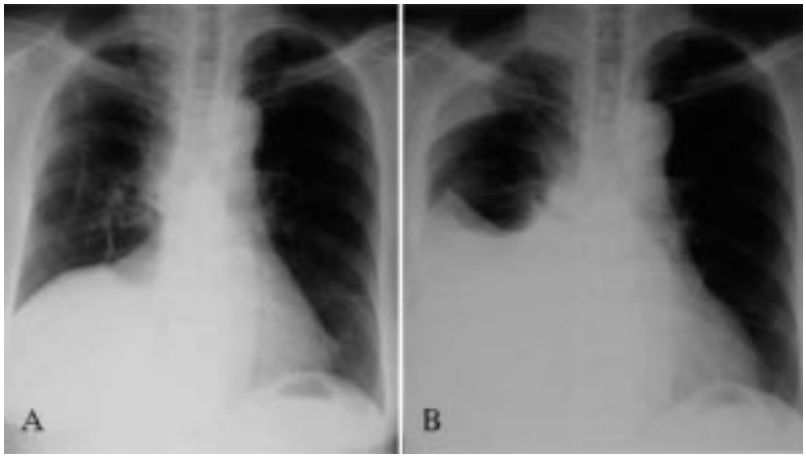

Fig. 1. (**A**) Chest roentgenogram taken on postoperative day 18, and (**B**) the chest roentgenogram leading to a diagnosis of postoperative chylothorax.

upper lobectomy and wedge resection of the right S6 with a resection of the mediastinal lymph nodes. The mediastinal lymph nodes resection was carried out with electric cautery and, when necessary, ligature. The final diagnosis was adenosquamous cell carcinoma in both S2 and S6; on the other hand, the lymph nodes demonstrated no metastases. According to Martini criteria,[7] we diagnosed double primary lung cancer; pathological stagings were pT2N0M0 (pStage IB) in S2 and pT1N0M0 (pStage IA) in S6. The thoracic drain was left in place until postoperative day (POD) 7. The patient made an uneventful recovery, and the chest roentgenogram on POD 18 showed almost normal findings (Fig. 1A). The patient was discharged on POD 19.

She consulted our outpatient clinic again for dyspnea on exertion and chest pain 14 days after leaving the hospital. A chest roentgenogram revealed massive pleural effusion in the right thoracic cavity, and she was therefore immediately treated with thoracic drainage; a total of approximately 2,500 mL of yellowish milky pleural effusion was removed (Fig. 1B). We diagnosed her disease as late-period-onset chylothorax, according to her admission observations. She underwent total parental nutrition with a complete cessation of all oral intakes. However, the drainage discharge continued at a rate of approximately 150 mL/day (Fig. 2). It was almost serous because of a cessation of fat, so we tried getting the patient to drink milk to confirm chyle leakage after 13 days of admission. The next day, a small amount of chyle discharge was seen in the chest tube, so we presumed that the chest tube was causing an obstruction and thus removed it on day 15 after admission. So after 17 days of conservative treatment had failed (POD 51 after the first thoracic surgery), it was decided that surgical treatment should be performed. The patient's progress after a chylothorax operation is shown in Fig. 3. She underwent a ligation of the chyle-oozing area; however, we detected a repeated chyle-oozing in this area, so we tried to ligate the lower thoracic duct and spread fibrin glue on these areas through an open thoracotomy. Subsequently, the discharge from the chest tube was serous, and oral intake was started on POD 5; however, a milky effusion was again recognized in the chest drain tube on POD 10. The pleural effusion triglyceride level was 192 mg/dL, and the cholesterol level was 57 mg/dL, thus resulting in a diagnosis of rechylothorax. We thereafter tried to infuse fibrin glue into the thoracic cavity through the chest drain tube on POD 11. The patient thereafter began oral liquid intake with a low-fat diet on POD 14 and thereafter gradually increased fat content in the diet. Eventually the left chest drain tube was removed on POD 17 after the chylothorax operation.

She is now alive without any further recurrence; she has survived 3 years since first presenting with the above symptoms.

Discussion

Chylothorax commonly occurs after an esophagectomy, and the cause tends to be secondary to an injury to the main thoracic duct. On the other hand, chylothorax after a pulmonary resection is relatively rare because the leak

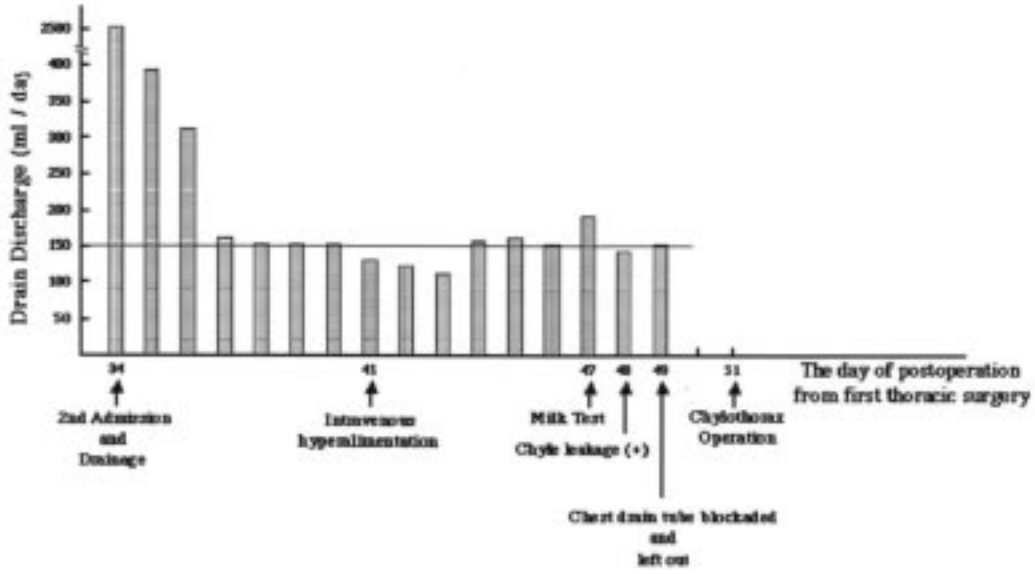

Fig. 2. The patient's progress after admission because of chylothorax and the transition of drain discharge.

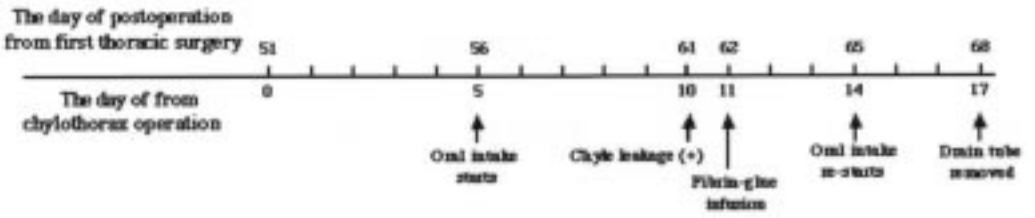

Fig. 3. The patient's progress after a chylothorax operation.

is usually from a tributary of the main duct as a result of a lymph node dissection. Most instances of chylothorax after a pulmonary resection have been reported to be diagnosed within 3 days after surgery because of oral intake starting within POD 1.[2)] In our case, the patient started oral intake on POD 1, and she was doing well after the operation. Drain-discharge gradually decreased, and the drain was removed on POD 7. Thereafter no pleural effusion was observed on a chest roentgenogram. However, dyspnea and chest pain were recognized 14 days after leaving the hospital. In this case the postoperative chylothorax appeared approximately 1 month after the pulmonary resection. The patient was initially managed by conservative treatment; however, surgery was eventually performed after the location of the thoracic duct leak was identified by an oral administration of cream preoperatively and also by an injection of cream via a naso-gastric tube during the operation. The oozing of chyle was detected in the upper mediastinal zone, mainly under the branch of the superior vena cava and the azygos vein; however, there was no clear oozing point in this area. We tried to ligate mediastinal pleura, including connective tissue around the oozing area. Furthermore, we tried to ligate the lower thoracic duct and then spread fibrin glue on this area because exuding chyle from the upper mediastinal area was detected. The patient, who lived in Guam in Western lifestyle, was accustomed to a high-fat diet. When in the hospital, however, she fasted or ate hospital food, which was nutrition controlled. Postoperatively, however, she ate many meals with a high fat content, which might have led to an increased flow in the thoracic duct and its collateral channels, thus leading to chyle leakage from collateral channels that had been damaged by the mediastinal nodal resection.

Generally, patients with chylothorax treated by conservative management, including treating the underlying cause, decrease the amount of chyle production, drain and obliterate the pleural space, and also provide appropriate

fluid and nutritional replacement. Moreover, the intrathoracic infusion of fibrin glue is also sometimes used to induce pleurodesis, and it is available for the control of chylothorax.[8] In our case, it was injected into the thoracic cavity by way of the thoracic drain because of rechylothorax in spite of thoracic duct ligation and intraoperative fibrin glue treatment. This treatment was able to completely control the chylothorax in our patient. We presumed that the cause of repeated chyle after lower thoracic duct ligation was minor leakage from an anomaly in the small thoracic duct.

The patient's hospital stay because of chylothorax totaled more than 5 weeks. Meanwhile, she endured the reoperation and the painfulness of the long-term drainage and fast. It brought on great mental distress, so she required and accepted mental care. We had to consider not only the threat to the patient's health, but also the possibility of causing mental damage because of the long-term treatment for uncontrolled chylothorax.

In conclusion, we herein reported a case that proved to be difficult to treat for a late-period-onset of chylothorax. This case suggests that a pulmonary resection with mediastinal lymph node resection risks late-onset chylothorax, and various types of treatments should thus be considered for such difficult cases if conservative treatment fails.

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