Video-Assisted Thoracic Surgery Lobectomy for Lung Cancer with Displaced B1+2

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A 52-year-old man was diagnosed with lung adenocarcinoma in the left upper lobe (c-T1bN0M0). Preoperative bronchoscopy revealed a displaced anomalous B1+2 arising from the left main bronchus. Multiplanar reconstruction computed tomography showed that the displaced B1+2 was located behind the left main pulmonary artery, and the interlobar fissure was largely fused. Video-assisted thoracic surgery (VATS) left upper lobectomy was performed successfully. The "no-touch fissure" technique was efficient not only for avoiding accidental cutting of the displaced bronchus but also post-operative air leakage. This is the first reported case of VATS lobectomy for lung cancer associated with a displaced B1+2.

Keywords: lung cancer, lobectomy, VATS, displaced bronchus, multiplanar reconstruction

Introduction

Because of the widespread use of bronchoscopy and computed tomography, bronchial anomalies are being reported at a small but not infrequent incidence of 0.64%. Tracheobronchial anomalies are classified as supernumerary bronchus and displaced bronchus. Most tracheobronchial anomalies are right-sided, and 75% of the tracheobronchial anomalies are in the right upper lobe. Displaced left B1+2 is relatively rare, with a reported incidence of 0.015%–0.3%. In this anomaly, a left B1+2 arises from the left main bronchus, and ascends behind the left main pulmonary artery. Here, we report the first case of video-assisted thoracic surgery (VATS) left upper lobectomy for lung cancer with a displaced B1+2.

Case Report

The patient was a 52-year-old man. He was referred to us because of an abnormal shadow on a screening chest radiograph. He had no particular past medical history. Computed tomography revealed a pulmonary nodule with a maximal diameter of 21 mm in the left upper lobe. Carcinoembryonic antigen was slightly elevated to 6.6 ng/ml. Bronchoscopy revealed the displaced anomalous B1+2 arising from the left main bronchus, while biopsy from the displaced bronchus showed the nodule was an adenocarcinoma. Multiplanar reconstruction computed tomography revealed the displaced B1+2 ascending behind the left main pulmonary artery (Fig. 1). Based on these results, the patient was diagnosed as having adenocarcinoma located in the left S1+2 with displaced B1+2 (c-T1bN0M0).

Left upper lobectomy by VATS was performed using our previously reported method. A 10 mm, 30° thoroscope was inserted through the seventh intercostal space in the midaxillary line. A 15 mm port for an assistant surgeon was made in the sixth intercostal space in the auscultatory triangle. An access window (35 mm) was created in the fourth intercostal space in the anterior axillary

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Received: March 31, 2013; Accepted: August 26, 2013
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Lung Cancer with Displaced B1+2 line. A hyperlobulation was observed between S1+2 and S3, while the interlobar fissure between the upper and lower lobes was largely fused. Therefore, we chose the “no-touch fissure” technique. In this technique, no dissection is performed in the fissure. Instead, the interlobar fissure is completed by a stapler when most of the hilar structures have been divided. In our case, the A1^2a and A1^2b were divided. Next, the displaced B1+2 ascending behind the left main pulmonary artery was identified (Figs. 2 and 3). The superior pulmonary vein, A^b+c, B^4+5, A'a, A1^2c, A^4+5, and the displaced B1+2 were sequentially divided. Following division of the vessels and bronchi, the largely fused interlobar fissure was divided by a stapler through the additional 15 mm port in the sixth intercostal space in the anterior axillary line. After interlobar fissure completion, the left upper lobe was removed. The point of “no-touch fissure” technique of this case is that after cutting off the B1+2, we could divide the branches of pulmonary arteries (A'a, A1^2c, A^4+5) and displaced B1+2, followed by division of the largely fused interlobar fissure. Hilar and mediastinal lymph node dissection was performed. The lymph nodes at #12 were submitted to analysis as intraoperative frozen sections and were found to be negative for metastases. The operating time was 103 minutes, and the blood loss was minimal.

Pathologically, the tumor was a papillary adenocarcinoma with a maximal diameter of 20 mm. Because of tumor invasion to the visceral pleura (pT1), pathological staging was diagnosed as pT2aN0M0. The postoperative
course was uneventful, and the patient was discharged from the hospital 4 days after surgery. The patient is now well without recurrence 12 months after surgery and without any postoperative adjuvant therapy.

Discussion

To date, only 4 reported cases of lung cancer have been associated with a displaced B1+2, including the present case (Table 1). In addition, the present case is the first report of a VATS lobectomy for lung cancer associated with displaced B1+2.

From the viewpoint of surgery, the relative position of the displaced B1+2 to the left main pulmonary artery is the most important point to consider. In 3 out of the 4 previously reported cases, the displaced B1+2 was located behind the left main pulmonary artery, where no bronchus exists under normal conditions. In 2 cases reported by Shimamoto and Tsukioka, the displaced B1+2 was cut unexpectedly by a stapler for interlobar fissure completion. In these 2 cases, the relative position of the displaced B1+2 to the left main pulmonary artery was not recognized preoperatively. In our case, preoperative multiplanar reconstruction computed tomography was helpful in recognizing the displaced B1+2 that was arising behind the left main pulmonary artery.

In addition, the fused interlobar fissure could have been the underlying cause of the unexpected cutting of the displaced bronchus. In 3 out of the 4 previously reported cases, the interlobar fissure was largely fused. For facilitating lobectomy in such cases, we recommend the “no-touch fissure” technique. In the “no-touch fissure” technique, the fused interlobar fissure is divided by a stapler after cutting of the pulmonary artery, vein, and bronchus. This technique is efficient not only for avoiding the unexpected cutting of the displaced bronchus but also post-operative air leakage. The VATS approach allows excellent visualization of both the anterior and posterior hilum, even without the interlobar fissure completion, in comparison with direct vision through minithoracotomy. Therefore, the “no-touch fissure” technique is highly suitable for the VATS approach.

Conclusions

We performed VATS lobectomy for lung cancer associated with displaced B1+2. Preoperative multiplanar reconstruction computed tomography is useful for analyzing the relative position of a displaced bronchus to the pulmonary artery. In addition, the “no-touch fissure” technique for fused interlobar fissure was efficient even in a patient with a bronchial anomaly.

Disclosure Statement

Keisuke Asakura and other co-authors have no conflict of interest.

References