

Video-assisted thoracoscopic superior segmentectomy of the right lower lobe

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ABSTRACT

Sublobar resections are still controversial for lung cancer, but for patients who can't tolerate lobectomy, such as those suffering from cardiopulmonary comorbidities and aged people, sublobar resections are better choices. Lobectomy and sublobar resections have similar surgical effect on patients with tumors ≤ 2 cm. A 64-year-old patient with chronic obstructive pulmonary disease (COPD) and poor pulmonary function on pre-operation evaluation underwent thoracoscopic superior segmentectomy with systemic mediastinal lymph node dissection. Three holes were adopted, the major operation hole was a 3 cm mini-incision in the 4th intercostal space of anterior axillary line. The patient has recovered well after the surgery.

KEY WORDS

Video-assisted thoracoscopic; sublobar resections; segmentectomy; chronic obstructive pulmonary disease (COPD); video; case

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Introduction

Lobectomy and pneumonectomy with systemic mediastinal lymph node dissection is the standard procedure for lung cancer, but for patients who can't tolerate lobectomy (such as those suffering from cardiopulmonary comorbidities and aged people), sublobar resections, including both segmentectomies and wedge resections, are better choices. For lung cancer, sublobar resections are still controversial. According to related literature reports, the recurrence rate after sublobar resections is higher than that of lobectomy, but the 5-year survival rates are similar. Lobectomy and sublobar resections have similar surgical effect on patients with tumors ≤ 2 cm. Thoracoscopic surgery is a minimally invasive technique for lung cancer, and segmentectomies, compared with lobectomy, contribute less trauma as well as faster postoperative recovery. Now segmentectomies are appropriate procedures for adenocarcinoma *in situ* ≤ 2 cm.

A 64-year-old patient with chronic obstructive pulmonary disease (COPD) had poor pulmonary function (FEV1 of 1.14 L, 45.6% of the predicted value, MVV of 54.57 L, 54.8% of

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Video 1. Video-assisted thoracoscopic superior segmentectomy of the right lower lob.

predicted value) on pre-operation evaluation. According to the chest CT, the mass lesion was on the superior segment of the right lower lobe, without hilar and mediastinal lymph nodes metastases. Before the operation, a CT-guided percutaneous lung biopsy was done, which revealed malignant cell suggesting the possibility of adenocarcinoma. The patient underwent thoracoscopic superior segmentectomy with systemic mediastinal lymph node dissection (Video 1) and has recovered well after surgery.

Operative techniques

Three holes were adopted: the major operation hole was a

3 cm mini-incision in the 4th intercostal space of anterior axillary line, and a 1.5 cm mini-incision with a 10 mm trocar was done as the thoracoscopic observation hole in the 7th intercostal space of midaxillary line. Furthermore, a 0.5 mm mini-incision was done as an assisted operation hole in the 7th intercostal space of scapular line. The surgeon stood in front or back of the patient in the surgeon's favor. In the operation, surgeon detected the specific position of the tumor, and confirmed the target pulmonary segment based on the preoperative chest CT, and then dissected the target pulmonary segment. After being dissected and isolated in the interlobar fissure, the superior segmental branch of pulmonary artery was ligated and closed by Hem-o-lock, and was then cut off.

After that, inferior pulmonary ligament was cut off, and the mediastinal pleura around hilum was dissected. Then bronchial artery was cut off, and subcarinal lymph nodes were dissected. The next step was to dissect superior segmental vein along the inferior pulmonary vein, and deal with Hem-o-lock in the same way. Then segmental bronchus was isolated and lymph nodes between segments were dissected. Before cutting off the bronchus, we inflated the lung and identified the target segmental bronchus, and then cut it off by endo-GIA (blue or green staple). At last, we confirmed the segmental boundary after inflating the lung, and used endo-GIA to deal with segmental boundary. Then the specimen was resected and remaining hilar and mediastinal lymphadenectomy was done.

In the operation, aspirator and operation equipment was used through the 0.5 mm assisted operation hole, which helped reduce the injury of chest wall, especially the intercostal nerves. At the same time, surgeon cooperated aspirator with electric coagulation and ultrasonic scalpel, in order to eliminate hemorrhage and fog in time, keeping the operative field clear.

Comments

Currently, segmentectomies for lung cancer are still controversial due to the higher recurrence rate, and are mainly used in aged people and patients who suffer from cardiopulmonary comorbidities. Therefore, lobectomy is the first choice for patients who have good cardiopulmonary functions. This surgical video follows the principle mentioned above. In addition, the video provides clear operative field, proper surgical operation, as well as hilar and mediastinal lymphadenectomy. But the video would have been better if thoracoscopy was adjusted in time at some points. Besides, lymph nodes should be intact during the mediastinal lymphadenectomy, in order to avoid the possible plant metastasis of positive ones.

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