

Video assistant thoracoscopic (VATS) lobectomy: right lower lobe

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ABSTRACT

The 60-year-old female had a nodule in the right lower lobe of the lung, which was identified as a tumor by CT and PET-CT. Then the right lower lobectomy was performed. The posterior trocar placement, different from other surgery, is in the 5th intercostals space in the anterior latissimus dorsi, which can be built by a small incision when operation is needed. There is a vessel heteromorphosis that the inferior pulmonary vein and the mid pulmonary vein share the same stem. Also, this patient has many intumescencia lymph nodes. We can see, the lymph nodes can be ablated completely by VATS.

KEY WORDS

Video assistant thoracoscopic (VATS); right lower lobectomy; lymph node dissection; adenocarcinoma

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Introduction

Standard treatment of early-stage non-small cell lung cancer involves anatomic pulmonary lobectomy and mediastinal lymph node dissection. Traditionally, this procedure has been carried out via postero-lateral thoracotomy, requiring division of chest wall muscles and rib spreading. This is frequently associated with chronic postoperative pain, which may become incapacitating in 5% of patients.

One of the major potential advantages of video-assisted thoracoscopic (VATS) lobectomy is reducing the incidence of chronic post-thoracotomy pain.

Key aspects of the procedure include:

- ❖ Proper patient positioning;
- ❖ Access to the pleural cavity and appropriate positioning of operating incisions;
- ❖ Careful dissection of pulmonary arterial branches, using a “fissure-sparing” technique whenever possible to decrease the incidence of prolonged postoperative air-leaks;
- ❖ Division of lung parenchyma, blood vessels, and bronchus using ENDOGIA.

The VATS approach can be carried out with similar morbidity and similar oncologic outcome to traditional open surgery. We present VATS lobectomy for adenocarcinoma of the right lower



Video 1. Video assistant thoracoscopic (VATS) lobectomy: right lower lobe.

lobe in a 60-year-old patient (Video 1, the video emphasizes the steps of lobe resection and lymph node dissection).

Operative techniques

Case presentation

We will perform a VATS lobectomy in a 60-year-old patient with an adenocarcinoma of the right lower lobe. Oncologic surgery includes mediastinal lymph node dissection and the steps of anatomic right lower lobe resection.

Patient positioning and placement of incisions

Proper patient positioning is critical to a successful operation.

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We use 3 incisions: one anterior incision, one posterior incision, and the other inferior incision. The posterior trocar placement, different from other surgery, is in the 5th intercostal space in the anterior latissimus dorsi, which can be built by a small incision when operation is needed. The anterior superior incision may be enlarged to 3 or 4 cm and used as a working incision. The inferior incision is used for the thoracoscope. Except for the scope, endoscopic ports are usually not used. Instruments are inserted directly through the incisions. We use a combination of endoscopic and open-surgery instruments.

Exploration and tumor resection

We begin the procedure with an exploration of the pleural cavity. The tumor is identified in the superior segment of the right lower lobe. Secondly, according to the tactile orientation surgery, we locate the tumor accurately and perform the wedge resection using ENDOGIA. Tumor is adenocarcinoma according to the pathological report.

Division of the inferior pulmonary vein and bronchus

The inferior pulmonary ligament is mobilized by using hook cautery. When the inferior pulmonary vein is reached, the lung is retracted anteriorly to expose the posterior pleural reflection. The inferior pulmonary vein, having the same stem with the mid pulmonary vein, is dissected. Mobilization of the inferior pulmonary vein is carefully conducted with scissor. The inferior pulmonary vein is divided by an ENDOGIA loaded with a vascular cartridge. Clearing the lymph nodes around the pulmonary vein is good for exposing the bronchus and artery. The 11th lymph node is cleared. The tissue around the lower lobar bronchus is removed for fully exposing the bronchus.

Dissection of the fissure and branches of the pulmonary artery

The lung is retracted posteriorly to expose the major fissure between the middle and lower lobes. The inferior lobe bronchus and artery lie deep to the fissure. Here, we perform the blunt dissection on the gap between the inferior lobar bronchus and lung by scissor. An ENDOGIA stapler is used. In this case, it is important to make sure that the stapler remains above the artery. It is important to stay in the right plane, so as not to

tear pulmonary parenchyma, which may result in prolonged postoperative air leaks. The basal branch of the pulmonary artery is identified and dissected and the artery to the superior segment of the lower lobe is identified. Care is taken to avoid thermal trauma from cautery. Scissors may be used safely as well. The arteries are stapled using an ENDOGIA stapler loaded with a vascular cartridge and inserted through the anterior inferior incision. During stapling, it is critical to avoid any tension on the stapler to avoid tearing the artery.

Specimen extraction and lymph node dissection

The lobe is extracted through the anterior superior incision using a specimen retrieval bag. The incision may have to be slightly enlarged to allow extraction. Any remaining lymph nodes may be removed at this time.

- ❖ Subcarinal lymph nodes are collected;
- ❖ Clearing the lymph nodes of station 2R and 4R;
- ❖ Clearing the pulmonary hilar lymph nodes;
- ❖ Clearing the lymph nodes of station 3.

The lung is re-expanded. We use two chest tubes introduced through two of the thoracoscopy ports. The remaining incisions are closed in standard fashion.

Comments

This is a very interesting yet a difficult right lower lobe lobectomy by VATS. Firstly, there is a vessel heteromorphosis of this patient. The inferior pulmonary vein and the mid pulmonary vein share the same stem, which is not like that of most patients with superior pulmonary vein and the mid pulmonary vein sharing the same stem. A careful exploration was performed during the surgery so that injury of the mid pulmonary vein by mistake can be avoided. Secondly, the surgery performing the blunt dissection on the gap between the inferior lobar bronchus and lung by scissor is very skillful, which makes the operation completed smoothly. Thirdly, the lymph nodes can be better ablated completely by VATS compared with by open surgery.

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