

## Video-assisted thoracic surgery (VATS) right upper lobectomy

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### ABSTRACT

Video-assisted thoracic surgery (VATS) plays supplementary role to the open surgery in the thoracic surgery. As the clinical education and VATS procedure developed, more patients are willing to take VATS surgery than open surgery if the condition permits. With the help of proficiency and HD thoracoscopic instruments, nearly all open surgery can be done, theoretically, in VATS either. In addition the better accessibility to the operative video and academic meeting greatly propel the prevalence of VATS surgery. Here I present a VATS right upper lobectomy case to communicating operative techniques.

### KEY WORDS

Video-assisted thoracic surgery (VATS); surgery; video; right upper lobectomy; case

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### Introduction

Since the beginning of the 1990s, thoracoscopic surgery has acquired widespread favor with the rapid development of associated techniques and instrumentation. We first performed VATS lobectomy in 2007, and becomes the best choice for those Ia stage NSCLC patient with faster recover. The rapid development of the thoracoscopic recording system provides an excellent platform for surgeons to communicate their academic views by showing their operative video. Here we present a VATS right upper lobectomy case to communicating operative techniques.

### History

Female, 68-year-old. The patient had a chief complain of dyspnea aggravate with activity for one year, has the history of TB infection and hypertension, disclaimed of coughing and fevering. Chest computed tomography (CT) shows a shadow in the upper right lobe (Figure 1). Biopsy and histochemistry examination indicates adenocarcinoma. PET-scan indicates no sign of metastasis.



Figure 1. A shadow in the right upper lobe.

### Operative techniques (Video 1)

Surgery was conducted under general anesthesia using double lung-ventilation with patients in the decubitus position. In VATS lobectomy, a 2.0-cm-long skin incision was made at the 8th intercostal space of the midaxillary line as the first trocar hole for observing the pleural cavity with a 10-mm-diameter thoracoscope. A skin incision of 3-4 cm was made for minithoracotomy without muscle layer dissection or rib resection at the 4th intercostal space of the middle axillary line (5<sup>th</sup> for the low lobe surgery). Another 1-cm incision was made in the auscultatory triangle.

According to my own experience, VATS procedure is an important complementary and extension to the open surgery. While, it demands rich open surgery experience as anatomical foundation and systematic exercise to accommodate the transmission from direct-view to 2D screen. Besides, it is really important to form a fixed team, since the teamwork between surgeon and assistant to provide better exposure is a key factor

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**Video 1.** Video-assisted thoracic surgery (VATS) right upper lobectomy.

for a successful VATS procedure.

The whole procedure can be generally divided into 5 steps:

- (I) Mobilize and divide the superior pulmonary vein;
- (II) Mobilize and divide the apical segment artery and ascending branches (artery absent in this patient);
- (III) Open the incomplete fissure with Endo-GIA stapler;
- (IV) Mobilize and divide the bronchus;
- (V) Systematic resection of the lymph nodes.

### Operative data and hospital course

- (I) Thoracoscopic operation time: 60 min;
- (II) The intraoperative bleeding volume: 150 mL;
- (III) No intraoperative complications;
- (IV) ICU stay: 1 day;
- (V) Postoperative pathology result shows: 12 lymph nodes removed were all negative for carcinoma.

### Comments

In my point of view, the VATS procedure should vary from patient to patient, depends on the individual condition, rather than following fixed pathway for all patient. However, we do observe some common principles:

First and for most, the surgery should comply with the principle of oncology, in other words: pulmonary vein enjoys the priority to divide to avoid the circulative tumor metastasis.

Secondly, the surgical approach depends on the fissure development condition: when the patient's fissure is well developed, we prefer to expose, mobilize and divide the pulmonary artery branches in the fissure; While, the patient suffers incomplete fissure, we prone to expose, mobilize and divide the apical segment artery from the anterior wall of the hilum, then take care of the ascending branches. However, in this case, the patient's ascending branch is absent and the absence incidence rate is less than 30 percent as reported.

Last but not least, we did lymph nodes resection as a dispensable step for following reasons: In the first place, though the PET-CT indicates no lymph nodes metastasis, the examination itself has around 10 percent false negative rate. In the second place, since the pathology result is still the gold standard test in tumor staging, we remove the lymph nodes partially for getting precise staging information to guide the subsequent treatment. In the third place, we did it for the anatomical purpose: this patient suffers severe lymph nodes carbonization and often adherent to adjacent tissue, removal of the lymph nodes can provides better exposure.

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