

Uniportal video-assisted thoracic surgery right upper lobectomy with systemic lymphadenectomy

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Abstract: This video demonstrated a performance of uniportal video-assisted thoracoscopic surgery (VATS) right upper lobectomy with systemic lymphadenectomy. The patient had a malignant mass in his right upper lobe. The operator took a posterior to anterior approach to dissect the right upper lobe, the adjacent structures were clearly demonstrated after the entire dissection of mediastinal lymph nodes. Postoperative pathological report suggested the stage of the tumor was T1bN0M0 (stage IA).

Keywords: Uniportal; video-assisted thoracoscopic surgery (VATS); lobectomy; lung cancer

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Introduction

As one of the minimal invasive surgery approach for thoracic surgery, uniportal video-assisted thoracic surgery (VATS) has been made great progress with the development of surgical technic and instruments. Now growing evidences show the feasibility and safety of uniportal VATS lobectomy for lung cancer (1), although the long-term outcomes are need to be tested in the future. Here we demonstrate a right upper lobectomy with systemic lymphadenectomy for lung cancer by using uniportal VATS approach.

Clinical data

A 51-year-old man had a 3-month history of right lung shadow in X-ray. After 2 months of anti-infective therapy, X-ray showed no significant changes, then a nodule (2.5 cm in diameter) in right upper lobe was detected by CT. PET-CT revealed that the nodule was hypermetabolic with no other metastasis. The result of fine needle aspiration (FNA) verified the nodule was adenocarcinoma. After preoperative preparation, the patient was underwent uniportal VATS lobectomy with systemic lymphadenectomy. Postoperative pathological report suggested the stage of the tumor was T1bN0M0 (stage IA).

Operative techniques

After being anesthetized with double-lumen endotracheal intubation, the patient was positioned in left lateral decubitus position. The uniportal incision located in the 5th intercostal space, anterior to latissimus dorsi and posterior to pectoralis major. We used a lap-protector to avoid contamination. Both the operator and the camera holder stand on the ventral side. In this video, the procedures were as followed (*Figure 1*):

- Exploration of chest revealed no pleural adhesions, no pleural effusion and no pleural nodules;
- After cutting open the mediastinal pleura form horizontal fissure to right hilus pulmonis, the operator performed the dissection of level 10 and level 11 lymph nodes, which would facilitate subsequent dissection of vasa publicas;
- After remove of level 10 lymph nodes, we could identify the borders of level 10 lymph nodes: superior vena cava, arch of azygos vein, upper lobe pulmonary artery and upper lobe pulmonary vein;
- Dissection of level 11 lymph nodes and oblique fissure from ventral to dorsal would facilitate the exposure of the posterior ascending artery;
- The posterior ascending artery was well exposed by



Figure 1 Uniportal video-assisted thoracic surgery right upper lobectomy with systemic lymphadenectomy (2).

Available online: <http://www.asvide.com/articles/1110>

remove of all the adjacent level 11 lymph nodes, and was cut off by a stapler subsequently;

- The operator cut open the mediastinal pleura from dorsal to cranial in order to expose the upper lobe bronchus. After this step, the mediastinal pleura around the upper lobe was entirely cut open;
- After dissection of the lymph nodes around it, the upper lobe bronchus was well dissociated by forceps and then transected by a stapler;
- It is easy for operator to expose and cut off the apical segment artery after transection of the upper lobe bronchus;
- After dissection of the lymph nodes between pulmonary artery trunk and bronchus, operator transected the remanent upper lobe pulmonary veins and anterior segment artery by one stapler;
- Next to use a bag to take the specimen out, operator began to dissect mediastinal lymph nodes by using hook electrode and harmonic scalpel to minimize blood;
- After performing an entire dissection of subcarinal lymph nodes, we could clearly identify the esophagus and right principal bronchus;
- Dissection of the lymph nodes below arch of azygos vein would facilitate the dissection of level 2 and level 4 lymph nodes, which were surrounded by superior vena cava anteriorly, trachea posteriorly, innominate vein superiorly and azygos vein inferiorly.

Before we finished the operation, a chest tube was put into chest through the uniportal incision, and a pig-tail tube was put into chest at 8th intercostal space.

Comments

With the prevalence of low-dose computer tomography (LDCT), more and more small nodules like ground-glass nodule (GGN) will be detected and maybe treated by surgery. Since the long-term outcomes of VATS for early stage lung cancer have been proved to be similar with thoracotomy (3,4), to improve the quality of life postoperatively, thoracic surgeons have tried their best to minimize the invasion of VATS. Nowadays, uniportal VATS has been already applied in lobectomy for lung cancer, even for advanced stages cases (1) and complicated sleeve resection (5). Although a recent review suggested uniportal VATS had the same postoperative short-term outcomes with conventional VATS (6), RCTs are necessary for uniportal VATS to verify its reported advantages and potentiality of being regular operation.

On the other hand, some surgeons are concerned about the safety, indication and outcomes of uniportal VATS for complicated operations. However, with the development of instruments and surgical skills, uniportal VATS is expected to have a broad application prospect because we think uniportal VATS is an evolution of conventional VATS, they share the same instruments, the same surgical principles and the same strategies of trouble-shooting. It is reported that extending the indications of VATS lobectomy will not compromise the short-term results (7). Otherwise, we should pay attention to the important of learning curve. Uniportal VATS requires higher level of acquainted anatomical knowledge, special surgical strategy and skill and experience for VATS trouble-shooting, thoracic surgeons should do more practice of conventional VATS before starting uniportal VATS. In conclusion, courage and practices are keys to successful uniportal VATS.

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None

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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