Video-assisted thoracic surgery for lung carcinoma

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Introduction

The incidence of lung carcinoma has increased worldwide. Surgical treatment remains the primary treatment for lung carcinoma. To achieve radical tumor resection and minimize the trauma has been the target of the surgeon. Video-assisted thoracic surgery (VATS) for lung carcinoma was first described more than 20 years ago (1). Compared with conventional open surgery, the advantages of VATS for carcinoma of the lung include reduction of surgical trauma, postoperative pain and intraoperative blood loss, less operative time, less effect on pulmonary functions, fewer complications and rapid recovery (2-4) with long-term survival similar to that of conventional open surgery (5).

However, for some reasons, the development and promotion of this technique has been slow. Lobectomy by VATS is more complex than open operation. In the beginning stage, the surgeons have been accustomed to the traditional open surgery mode. When there is no mature endoscopic model, simply turning the pattern of traditional open surgery to the endoscopic operation increases the difficulty of operation and extends the surgeon of the learning curve. On the other hand, endoscopic lobectomy requires the application of special instruments. Until now, it has been successfully applied and reported in large scale hospital, and considered to be a safe, effective and acceptable way in the treatment of lung cancer. In our team, endoscopic lobectomy was started in 2008. Base on the accumulation of experience, here we summarized and described our preferred approach for minimally invasive lobectomy.

VATS for lobectomy (Video 1)

The patient was intubated with a double lumen endotracheal tube with single-lung ventilation and intravenous anesthesia. The patient was placed in a lateral position. The surgeon stood anterior to the patient. Three ports were made in this surgery. A thoracoscope was placed in the 7th intercostal space at the mid-axillary line. A working port (3-4 cm) was located in the anterior axillary line in the 3rd intercostals. An assistant port was located in the 9th intercostal space between the posterior axillary line and subscapular line.

VATS for lobectomy is divided into steps:

(I) The right upper lung lobe was retracted posterior;

(II) The electrocoagulation hook and suction tip were used to incise the mediastinal pleura and fully expose the right superior pulmonary vein and the first branch of right pulmonary artery;
These two vessels were isolated and transected with the endo-stapler through the assistant port;

(III) The remaining branches of the right upper lobar pulmonary arteries were exposed, ligated with 7-0 silk thread and hemo-lock (5 mm), and transected with a harmonic scalpel;

(IV) The upper lobe bronchus was then fully exposed and transected with the endo- stapler through the assistant thoracoport. (The hilus pulmonis and branch lymph nodes were dissected and removed during the lobectomy);

(V) The ninth group of lymph nodes were dissected and removed;

(VI) The right upper lung lobe was retracted anterior, the seventh group of lymph nodes were dissected and removed;

(VII) The arch of the azygos vein and upper mediastinum was exposed. The 2, 4, 4R groups of lymph nodes were dissected and removed;

(VIII) The drainage tube was placed in the thoracic cavity, and the incision was closed.

Discussion

During the early clinical practice, peripheral lung cancers (diameter of the tumor ≤5 cm) have been considered to be the indication for VATS lobectomy (6,7). In our opinion, NSCLC >5 cm

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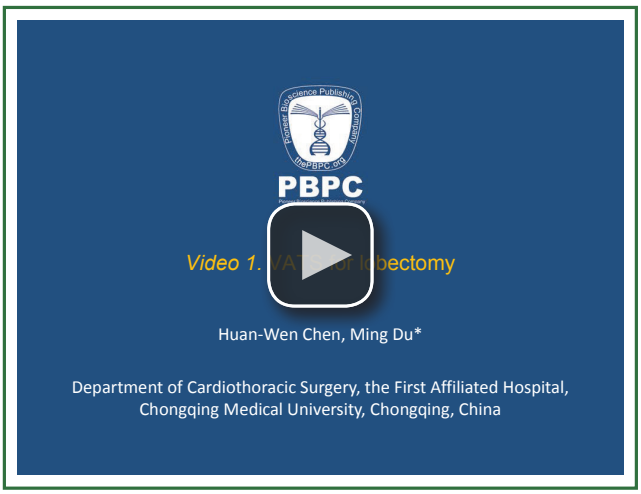

Video 1. VATS for lobectomy.

in diameter also can be performed VATS lobectomy.

Pleural adhesion is not the indication for conversion to open thoracic surgery. Three ports were made in this surgery. A thoracoscope was placed in the 7th intercostal space at the mid-axillary line. A working port (3-4 cm) was located in the anterior axillary line in the 3rd intercostal space. An assistant port was located in the 9th intercostal space between the posterior axillary line and subscapular line. As for pleura adhesion, two tunnels were built by fingers or oval clamp, one connected two holes between the thoracoscope and working port, the other one connected two holes between the thoracoscope and assistant port. Electric coagulation hook and aspirator were used to deal with pleural adhesion, which is even more easily than open surgery. We performed VATS lobectomy by three ports and considered that they were enough for this surgery. The main working port was located in the anterior axillary line in the 3rd intercostals, adjacent to the hilum. In this situation, there is a shorter distance between the hilar structures and the port. An assistant port was located in the 9th intercostal space between the posterior axillary line and subscapular line, parallel to the mediastinal plane, which facilitates the placement of the endo-stapler and isolation of vessels and bronchi.

We perform VATS lobectomy with fixed surgical steps. This method can isolate hilar structures from the shallow to the deep without repeatedly turning over the lobes.

Instead of systematic sampling, systematic lymph node dissection was used, which is more in line with the goal of surgical oncology.

Conclusions

This method is believed to be safe, effective and easily replicable.

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