

VATS left upper lobectomy

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ABSTRACT

A 60-year-old female patient was admitted due to multiple ground-glass nodules in the left upper lobe, which was found on her health screening 20 days ago. Preoperative examinations showed no obvious abnormality. Also, no distant metastasis was found during the preoperative examinations, and her heart and lung functions could tolerate the lobectomy. Chest computed tomography (CT) showed multiple ground-glass nodules on the left lung, which were considered to be early malignant lesions; In addition, no remarkably swollen lymph node was visible in the mediastinum. Therefore, VATS left upper lobectomy was performed, and intraoperative frozen section confirmed the diagnosis of adenocarcinoma.

KEY WORDS

VATS; left upper lobectomy; high-intensity focused ultrasound (HIFU); sequential dissection

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Procedure (Video 1)

The four-port method was applied: the observation port was made in the 7th intercostal space at the middle axillary line; The main working port was in the 4th intercostal space at the anterior axillary line; And the remaining two auxiliary ports were located in the 8th intercostal space and the 5th intercostal space at the posterior axillary line, respectively.

Sequential dissection (i.e., left superior pulmonary vein-left upper lobe bronchus-branches of left pulmonary arteries-crack) was applied. The main device used in the surgery was high-intensity focused ultrasound (HIFU), which is featured by good hemostatic effect, clear operative field, and multiple procedures including clamping and propping using its different parts.

Firstly, a VATS lung clamp was applied to lift the left upper lobe to expose the pulmonary hilum. HIFU was then applied to open the pleura covering the surface of superior pulmonary vein and continued downwards to identify the presence of inferior pulmonary vein. Meanwhile, the spaces between the superior pulmonary vein and its deep bronchi were separated, and the lymph nodes in the pulmonary hilum (station 10, near the root



Video 1. VATS left upper lobectomy.

of left lung artery) were dissected. After the left pulmonary trunk was exposed, the left superior pulmonary vein was dissociated, followed by the treatment using Tyco endoscopic cutter and white staple cartridge.

The left main bronchus was dissociated, and the station 7 (subcarinal) lymph nodes were dissected in the front of the pulmonary hilum. After the left main bronchus was completely exposed and after the left upper lobe bronchus was completely dissociated at the bifurcation of the upper and lower lobe bronchi, Tyco endoscopic cutter and green staple cartridge were applied.

The distal stump of the left upper lobe bronchus was clamped to tract the left upper lobe backwards. HIFU was used to dissect the interlobar lymph nodes near the pulmonary trunk and to dissociate the branches of the left upper lobe pulmonary artery.

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There were four branches. The third and fourth branches on the same anatomical plane were jointly treated with Tyco endoscopic cutter and white staple cartridge; however, since the first branch was relatively thick, it was treated with Tyco endoscopic cutter and white staple cartridge alone; the remaining branch (the second branch) was relatively thin, and therefore it was transected with HIFU after having been ligated with Hem-o-lok clips twice near the heart.

The well-developed interlobular fissures were divided using HIFU, and then the left upper lobe was placed in an endobag and extracted.

Comments

Sequential dissection (or, single-direction approach) was applied



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in this surgery to avoid frequent turn-over of the lung lobes and shift of visual angle during the procedures. Also, the HIFU used in this surgery enables rapid dissection and dissociation, with clear visual field and small blood loss. By thoroughly utilizing the functions and structure of HIFU, we can both dissect and divide tissue and perform operations including lifting, propping, clamping, and dividing, which saves the time needed for changing devices in conventional surgeries and makes the surgery smoother.

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